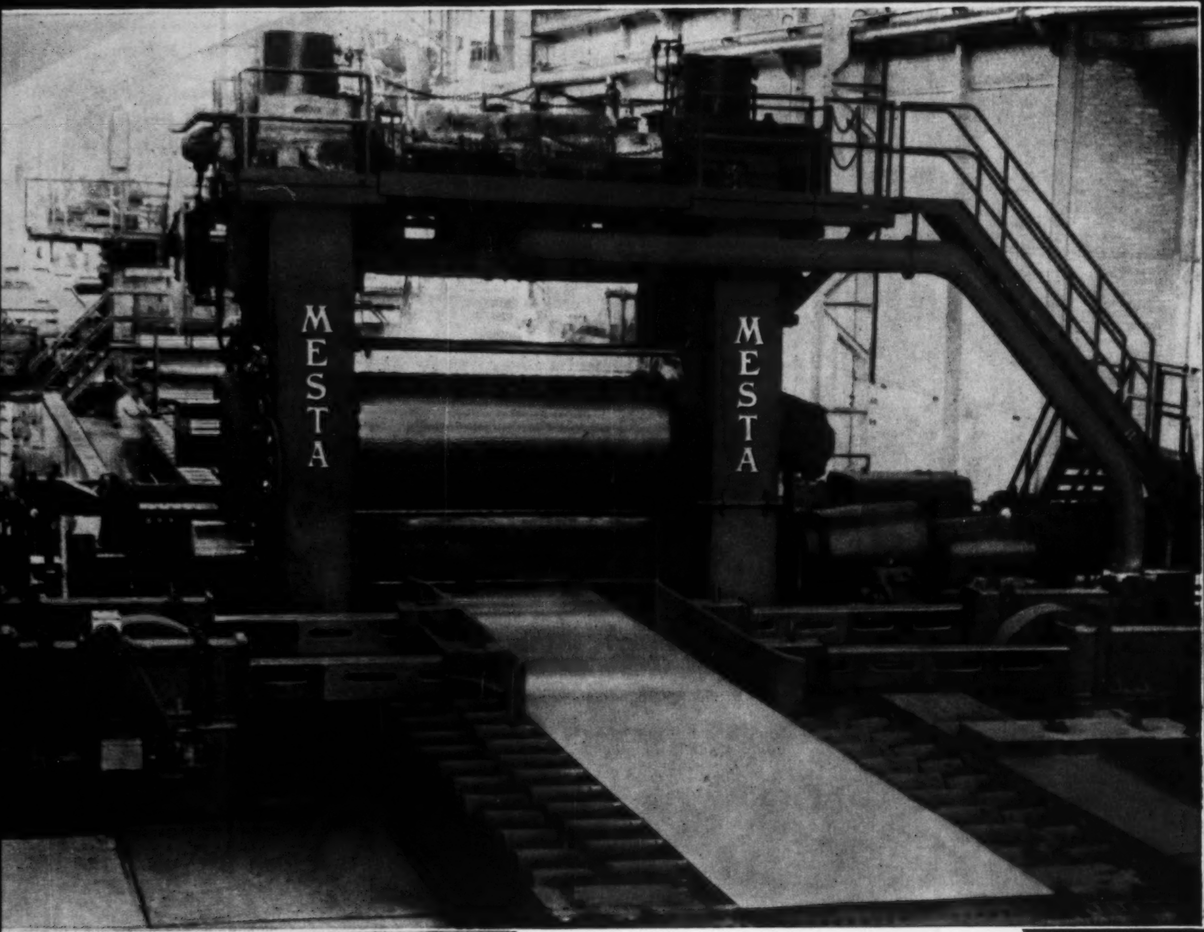
IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication FEBRUARY 2, 1961

★ Arbitration Experts Discuss:

Are Arbitration Costs Getting Out of Hand? p. 53

Plus Side of Foreign Investment p. 60
Where Welding Stands in Russia p. 81
Digest of the Week p. 2-3



MESTA 132" FOUR-HIGH REVERSING PLATE MILL OPERATING
AT SOCIETE ANONYME COCKERILL-OUGREE, BELGIUM

PLATE MILLS

Designed and Built by **MESTA**

Designers and Builders of Complete Steel Plants
MESTA MACHINE COMPANY
PITTSBURGH, PENNSYLVANIA

Steel

for strength
. . . economy
. . . versatility

Re-designed as a drop forging, this dual-wheel tail caster for a Navy combat plane has not been known to fail in service, in spite of the crushing impact it must absorb during landings.

This critical part used to be fabricated. Five separate pieces welded together. Expensive. Hard to inspect. Lots of machining.

Then a forger designed it as a drop forging. Besides cutting manufacturing costs, the improved design made a much stronger part. The forging was easier to inspect, as well.

IT'S FORGED IN STEEL

. . . for forged-in strength!

Forging design—key to low-cost, long-service parts

With the modern techniques and modern steels available to the forgings engineer, he is able to translate almost any parts problem into a practical forging design. If you require less weight and more strength, lower cost and longer life, faster production and improved performance for the parts you manufacture, look for the answer in a drop forging.

No one knows better than the forger that *the quality of the steel is a forging's most important ingredient.* That's why so many forgers use Bethlehem steels—carbon and alloy grades they can always depend on to satisfy their customers' requirements. You'll find you can depend on them, too.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

THE IRON AGE
Chestnut and 56th Sts.
Philadelphia 39, Pa., SH 8-2000
GEORGE T. HOOK, Publisher
EDITORIAL STAFF
TOM C. CAMPBELL, Editor-in-Chief
GEORGE F. SULLIVAN, Editor
E. C. BEAUDET, Managing Editor
News Editor R. D. Raddant
Technical Editor J. J. Obrzut
Asst. News Editor H. R. Neal
Machinery Editor R. H. Eshelman
Metallurgical Editor C. L. Kobrin
Welding Editor R. R. Irving
Nonferrous Editor—N. Y. F. J. Starin
Art Director T. S. Paaby
Associate Editors: P. J. Cathey, W. N. Redstreake, J. D. Baxter, R. J. Radomski, B. F. Surer, Assistant Editor: G. C. Sekula. Regional Editors: K. W. Bennett, Chicago; T. M. Rohan, Cleveland; A. E. Fleming, Detroit; R. R. Kay, Los Angeles; G. J. McManus, Pittsburgh; G. H. Baker, R. W. Crosby, Washington. Correspondents: F. L. Allen, Birmingham; N. Levenson, Boston; R. E. Koebbe, St. Louis; J. Miller, San Francisco; R. Kazarian, Buffalo; D. R. Coughlin, Seattle; A. T. Collins, Houstin; F. Sanderson, Toronto; F. H. Hartley, London, England. Chilton Editorial Board; Paul Wooton, Washington representative.
Robt. Gunning—Readability Consultant
WASHINGTON EDITORIAL OFFICE
Washington 4.....National Press Bldg.
BUSINESS STAFF
Marketing Manager R. H. Groves
Circulation Manager W. M. Coffey
Production Manager Warren Owens
Promotion Manager D. B. Pollock
Mkt. Research Manager G. V. Shanno
Census Manager William Laimbeer
Research Consultant Oliver Johnson
REGIONAL BUSINESS MANAGERS
*Denotes editorial office also
Atlanta 3..............J. W. Sangston
32 Peachtree St., N. E. Jackson 3-6791
*Chicago 1 T. H. Barry, W. R. Pankow
360 N. Michigan Ave. Randolph 6-2166
*Cleveland 15..C. B. Shaw, R. L. White
W. J. Devlin
930 B. F. Keith Bldg. Superior 1-2860
Columbus 15, Ohio...Harry G. Mumm
LeVeque-Lincoln Tower Capital 1-3764
Dallas 6....................W. J. Smyth
189 Meadows Bldg. EMerson 8-4751
*Detroit 2...............W. J. Mulder
103 Pallister Ave. Trinity 1-3120
*Los Angeles..........R. Raymond Kay
3320 Strand
Manhattan Beach SPring 2-1819
*New York 17..C. T. Post, I. E. Hand
100 E. 42nd St. Oxford 7-3400
*Philadelphia 39 Sherwood 8-2000
B. L. Herman, J. A. Crites, W. E. Carr
*Pittsburgh 19.............T. M. Fallon
1707 Frick Annex Bldg. Atlantic 1-1830
San Francisco 3..............Don May
1355 Market St. UNderhill 1-7107
W. Hartford 7...........Paul Bachman
62 LaSalle Rd. Adams 6-4237
London, S. W. 1.......M. F. Holsinger
Director of International Operations
67/68 Jermyn St., St. James's
TRafalgar 6318
J. H. Kofron.....Chilton Research Dir.
CHILTON OFFICERS & DIRECTORS
G. C. Buzby, President
Vice-Presidents: P. M. Fahrendorf, L. V. Rowlands, G. T. Hook, R. E. McKenna; Treasurer: W. H. Vallar; Secretary: J. A. Montgomery; Directors: M. E. Cox, F. P. Tighe, E. B. Terhune, Jr., R. W. Case, Jr., C. A. S. Heinle, J. H. Kofron, G. E. Cameron. Comptroller, Stanley Appleby. Indexed in Applied Science & Technology Index and Engineering Index.

Copyright 1961 by Chilton Company

THE IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only or to people actively engaged therein. $2 for 1 year. $3 for 2 years in the United States, its territories and Canada. All others $15 for 1 year; other Western Hemisphere countries, $25; other Foreign Countries, $35 per year. Single copies 50¢. Annual Review Issue $2.00. Cable: "Chilton," Philadelphia

The IRON AGE

February 2, 1961—Vol. 187, No. 5

Digest of the Week in

★Starred items are digested at right.

EDITORIAL

State of the Nation: Youth Plots Its Course! 5

METALWORKING NEWSFRONT

Business Forecast 7
Metalworking Labor 9
Washington 11
International 13
Techfront 15
Market Planning Digest 51
★Report to Management 67
Spacefront 79
★The IRON AGE Steel Summary 123

NEWS OF THE INDUSTRY

★**Special Report:** Arbitration Costs—Are They Excessive? 53
★Maintenance Costs Can Be Curbed 56
Oxygen Mills Face Smoke Crisis 57
★Development Price Promotes Sales of Magnesium 58
★Change Trade Policy—But How? 59
★Foreign Investment Has Plus Value 60
Bethlehem Accepts 'Atom' Assignment 61
★Automotive 69
★West Coast 71
★Machine Tools 73

ENGINEERING-PRODUCTION

★What's the State of Welding Behind The Iron Curtain? 81
★Tumblers Use Centrifugal Force 84
★How to Repair Broken Gears 86
★Rock Forging Boosts Tube Strength 88
Cutter Mill Speeds Piston Flow 91
★Integrated Tools Shape Shafts 92
Magnets Space Sheets at Press 93

MARKET AND PRICE TRENDS

★Purchasing 124
Iron and Steel Scrap Markets 128
Nonferrous Markets 132

REGULAR DEPARTMENTS

Letters From Readers 17
Fatigue Cracks 19
Men in Metalworking 75
Design Digest 96
New Films 108
Patent Review 110
New Books 112
Free Literature 113
New Equipment 116
INDEX TO ADVERTISERS 146

News of the Industry

PLANT MAINTENANCE

Costs Can Be Cut—More machines in factories mean greater output, but higher maintenance costs.

The problem can be cured through new incentive plans and organization to control costs. P. 56

MAGNESIUM PRICES

New Formula—Just a short time ago, magnesium was suffering from a lack of demand. Now the Dow Chemical Co. has come up with a new pricing formula. Hopes are that new interest will be shown by the auto industry. P. 58

U. S. TRADE POLICY

Changes Likely—Deep concern over present U. S. trade position will bring changes. Strong possibilities: Executive action and flexible aid to the domestic industries hurt by imports. P. 59

FOREIGN INVESTMENTS

A Good Side—There are fac-

Metalworking

Cover Feature

ARBITRATION — Arbitrator David L. Cole and other labor specialists discuss climbing arbitration costs. Are the costs out of line? Pro's and con's are covered in this week's Special Report. P. 53

tors, the gold crisis for example, that make it appear that foreign investments by industry hurt the economy. A government survey, however, says there is a plus side to the picture. P. 60

REPORT TO MANAGEMENT

Will Prices Stabilize?—Despite some present price softness, there are prospects a period of stable pricing may be coming. If so, it would aid sales of U. S. goods at home and overseas. P. 67

Engineering-Production Developments

RUSSIAN WELDING

Study Gains—What's the state of welding behind the Iron Curtain? Welding in the Soviet Union has made steady gains. Right now, they seem to be on a par with us. To further automation, they're stressing research in electroslag and submerged-arc welding. P. 81

TUMBLING MACHINES

Use Centrifugal Force—Two new tumbling machines, one wet and the other dry, both incorporate centrifugal force in their cycles. This adds luster to the barrel-tumbled parts. Very bright results are obtained in little time. P. 84

REPAIR BROKEN GEARS

Choose Optimum Method—What do you do when a gear tooth or rim fails in the middle of a big production run? If a spare gear isn't available, there's only one solution. You must repair the damage. tion. There are many ways to repair broken gears. All of these repairs, however, should be considered temporary. P. 86

COMPRESSION FORGING

Boosts Tube Strength — Rock-forging raises the physical properties of welded tubing. The tubing is drawn under tension through tapered dies. These dies rock back and forth to compress and cold work the metal. P. 88

CONVEYOR SYSTEM

Speeds Shaft Production—Mechanization helps to transform tube stock into burr-free drive shafts for home washing machines. These complex shafts have 30-microinch rms finishes. P. 92

Market and Price Trends

AUTOMOTIVE

Price Cuts Loom—Foreign car sales were set back in 1960 with the rise of U. S. compacts, Renault has cut its Dauphine price and other foreign makers may follow. P.69

WEST COAST

N. Y. Woos Farwest—New York's Gov. Rockefeller made a trip west to launch his state's new commerce office there. P. 71

MACHINE TOOLS

Tax Reform Urged—Business in 1960 was below normal. Outlook for '61 depends on tax policies, executive says. P. 73

STEEL SUMMARY

Changing Market Pattern—The market is undergoing basic changes in product and buyer demand. Auto steel cutbacks are offset by surge of orders for many products. P. 123

PURCHASING

Office Buying—The Office Buyers Group of the National Assn. of Purchasing Agents can aid buyers in meeting problems. The chairman of this group gives pointers on buying office furniture. P. 124

NEXT WEEK

GAS INJECTION

Into Blast Furnace—Look for a new trend in ironmaking. No longer in the experimental stage, gas injection is turning out production runs. Results: Increased production; lower coke requirements.

HAPPY BIRTHDAY
© UPA PICTURES, INC.

The nearsighted MISTER MAGOO says . . . "1938? What magnificent memories. I gave that boy Corrigan his navigating instructions, and General Electric invented the reflector lamp. Happy birthday, G-E Reflector Lamps! Blast this carafe! How do they expect a man to get a cup of coffee?"

General Electric Reflector Lamps laugh off dirt and dust— send more light where it's needed

Now you can cut maintenance costs—*and get more light overnight*—without spending a penny for new lighting equipment or increasing your power costs.

How? Switch to General Electric Reflector Lamps in your filament or mercury lamp systems.

A pure silver reflector (or phosphor in mercury lamps) is sealed inside a specially shaped bulb where it can't get dirty. It directs more light *down* on the job—day in, day out. You get all the light you pay for. Everybody gets more light, can do better work faster.

Maintenance men seldom, if ever, have to clean fixtures. All they do is change burnouts—and the long, uniform life of G-E Lamps means changing can be done on a regular schedule.

General Electric *Filament* Reflector Lamps (developed in 1938) are available in 500-W, 750-W and 1000-W sizes with pure silver reflectors (above). G-E *Mercury* Reflector Lamps (1952) come in 400-W (silver or phosphor reflectors), and 1000-W (phosphor reflector) sizes. Your General Electric Lamp distributor can help you pick the best one for your business. Call him today. General Electric Co., Large Lamp Dept. C-12, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

State of the Nation: Youth Plots Its Course!

Youth is in the saddle of this nation. It isn't necessary to tally up the years to determine what youth is.

The President spelled out with unmistakable clarity the earmarks of this "younger" generation. He mentioned it in his inauguration text, but he outlined it in his state of the nation talk.

Its impact was hard, clear, and irrevocable. It was given in a voice and a demeanor which brooks no defeat. There was no question of where John F. Kennedy hopes to take this nation.

These are the earmarks of this young crusade: Studied impetuousness, controlled impatience up to a point, new ideas which are new, a quick departure from the past, a cold and abrupt attack on problems claimed to have no solution. And little or no respect for past performance unless it holds water. The most rugged sign of the times is the completely unquestioned confidence that, where others have failed, this group of young lions will succeed.

Past slowness is to be eliminated. The capacity of youth is to be exploited. Foreign policy is to reach goals by completely logical action—on our part and on the part of others. National growth is to be at an ever-rising pace. Poverty is to be repressed or eliminated in this nation.

Fuddyduddies who in the past have taken too long to make up their minds, or who have referred too much to committees, are on notice they are through—unless they produce results. Formality is to go by the wayside if informality quickly brings about the goals of this Administration.

Bluntly, Mr. Kennedy has cut the umbilical cord, the Gordian Knot and any other connections with the past. The people are now on their way to the greatest, the biggest, and the fastest period of experimentation, improvisation, and daring seen in recent history.

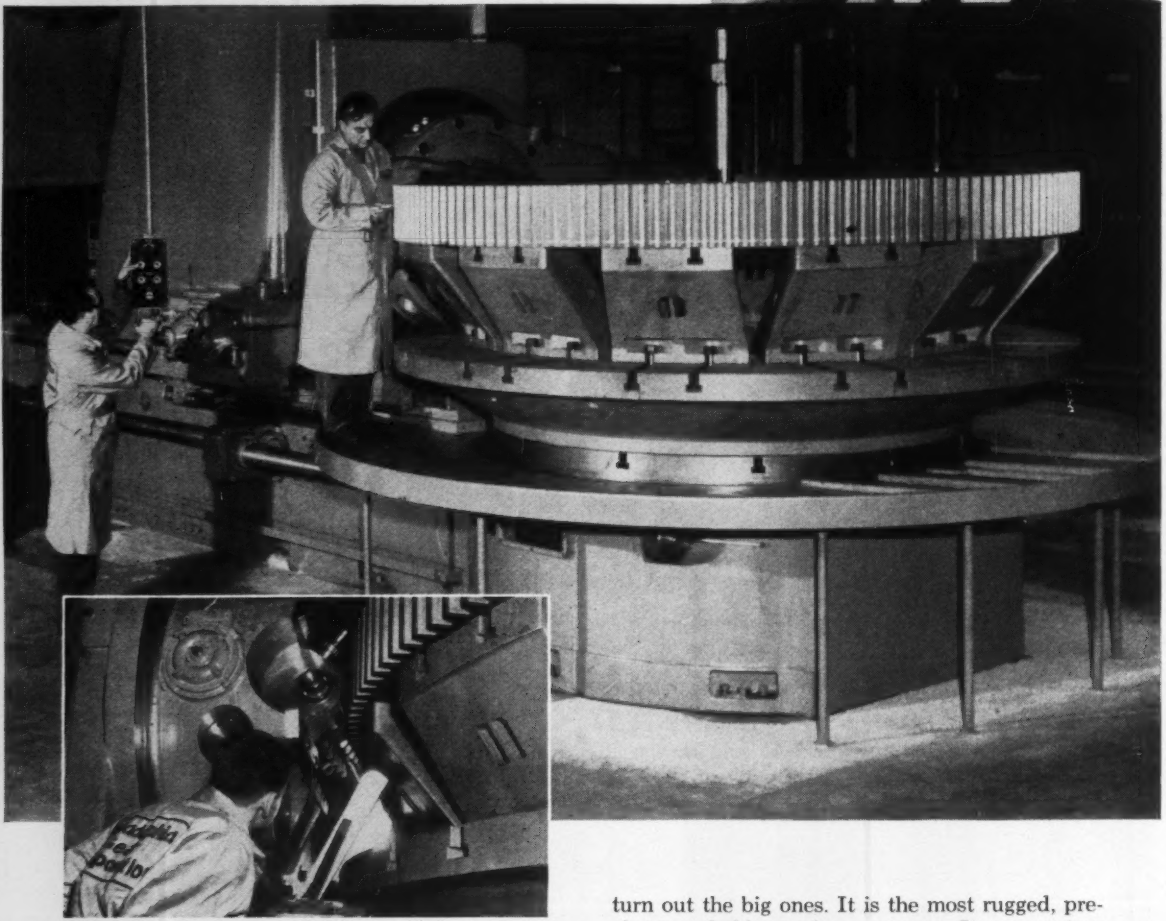
Whether it will work, how far it will get, and whether it will wreck the country in the process is in the future. But the battle of the ages has now been drawn in the United States. Older heads will be respected and courteous treatment will be accorded them. But the reins of the nation are in younger hands who feel they can do what the past has not done.

Whatever else we may think—depending on how old we are—it is certainly not going to be a dull life in these United States.

Tom Campbell

Editor-in-Chief

“Had to have extremely close tolerances...so I called Phillie Gear”



Phillie Gear's new hobber at work . . . will handle gears up to 165" dia., 64" face width.

Looking for commercial gearing, cut to exceptionally close tolerances . . . at no increase in cost? Then give us a call. We are equipped better than ever before to meet your needs with the highest quality commercial gearing available today.

This new hobber, the latest addition to our new and expanded facilities, is the machine that can turn out the big ones. It is the most rugged, precise gear hobber we've ever seen. It was custom built to our rigid specifications. Accuracy is certified to ten arc seconds.

Whatever your gearing requirement, our engineering staff is ready to work with you in finding a better solution to your gearing problems. And engineering is backed by the newest, most comprehensive production facilities in the industry.

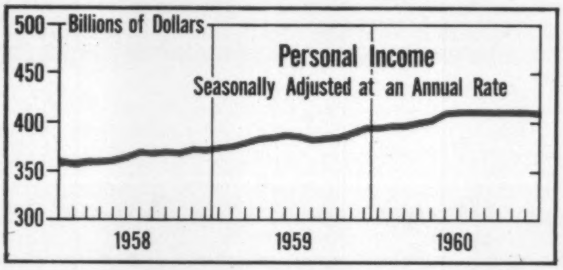
Philadelphia Gears

For complete data, write on your company letterhead for our gearing catalog G-127.

phillie gear® / **PHILADELPHIA GEAR CORPORATION**
King of Prussia (Suburban Philadelphia), Pennsylvania

Income Drop: How Serious?

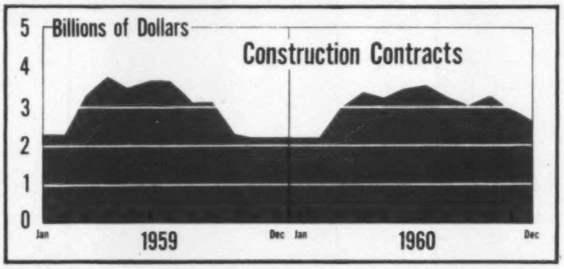
Personal income tapered off late in 1960. But the full year total of $404 billion is something to talk about. According to Dept. of Commerce figures, personal income last year was up 5.5 pct in dollars from 1959 and up a full 4 pct in real purchasing power. In spite of the second half recession, income from production was higher in 1960.



But the late-year decline was serious. And there is little in the immediate outlook to halt the decline in income. Personal income in December was at the annual rate of $406.5 billion, off about $2.5 billion from the November rate. The decline, as could be forecast, was caused by the cut in non-farm employment and in average hours worked per week.

Can Construction Hold '60 Pace?

Construction is looked on hopefully as one of the forces which can lead a recovery this year. A large volume of contracts awarded in December pushed construction to an all-time U. S. record in '60, F. W. Dodge Corp. reports.



December contracts totalled $2.7 billion, more than 20 pct over December, 1959. Total contracts for the year were $36.3 billion, slightly above the previous record set in 1959.

No Cheer in Housing Starts

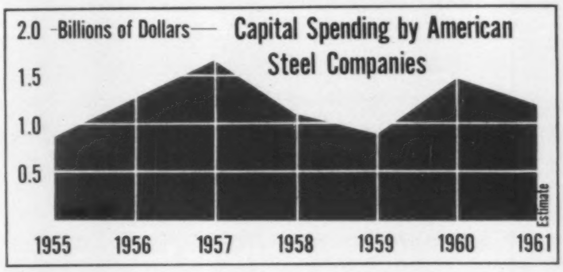
The decline in housing starts is one of the most serious factors in the business outlook. Seasonal declines had been expected, with a substantial pickup in the spring. Now, there are shadows of doubt.

Interest rates may stay too high to attract many home buyers. Vacancy rates are relatively high. With layoffs and unemployment much in the news, many in the middle income group (and it's not confined to this group alone) have enough doubts to hold up plans.

Best guess now is that it will be fall before there is a significant change in the housing market. This is one of the prime challenges of the new Administration: To revive a new home building program.

Steel Industry Spends to Improve

In spite of the recession in steel, plans for new plant and equipment spending are still strong. Very much so. Steel companies in the U. S. plan to spend about $1.2 billion in 1961 on capital improvements.



This is the new estimate of the American Iron & Steel Institute.

At the same time, cutbacks in earlier plans are now evident. A year ago, capital spending for 1960 was put at $1.7 billion. Instead, actual spending hit about $1.48 billion. Even though this represents some cuts, it is still only $243 million below the all-time record of $1.723 billion set in 1957.

"Private" Capacity Rate Planned

Steelmakers are planning to develop, sometime this year, a new, "more realistic" capacity rating. But it won't be of any aid in outside business forecasts—at least under present plans. Current plans apparently don't call for the new index to be made public.

Arthur B. Homer, president of Bethlehem Steel Co., revealed last week the new rate would include facilities used in reasonably normal economic conditions. It would eliminate marginal equipment used only when tonnage is the major consideration—such as in wartime or post-strike periods.

The information would be supplied to the government and presumably used within the industry.

CRANE
DESIGNERS

CRANE
BUILDERS

CRANE
Counselors
Since 1910

In designing and building cranes since 1910 this company has adhered to a policy of thoroughly studying each problem presented from the standpoint of conditions faced and service to be rendered in order to recommend the proper type of crane and equipment.

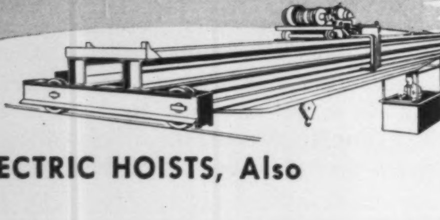
Growth in future demands is also considered and it is significant that some of the first Euclid Cranes manufactured are still in service. Impressive, too, is an uncommon record of repeat orders.

Euclid has the experience to study needs and render sound counsel to crane user; also engineering personnel and factory facilities to translate the facts obtained into equipment of the highest order.

You are invited to avail yourself of this counsel and can do so without entailing any obligation.

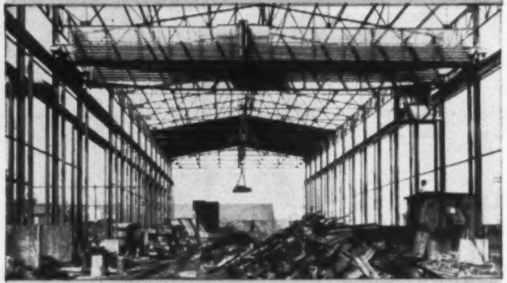
The EUCLID CRANE & HOIST Co.
EUCLID, OHIO

Euclid Cranes



ELECTRIC HOISTS, Also

Euclid Overhead Crane and Semi-Gantry Crane serving the assembly floor of a large machinery manufacturer.



Outdoor Crane equipped with two hoists; also facilities for operating both magnet and scrap iron grapple.

Indoor-outdoor, center controlled crane operating in a large shipbuilding plant.

Underslung, floor controlled crane designed to afford maximum use of a material warehouse.

Teamsters: Protect Central States Jobs

New Central States agreement, covering over-the-road Teamsters' truck drivers in Midwest states, emphasizes protection of job rights.

It provides an agency shop for right - to - work states, protection against discipline for refusal to cross picket lines or handle hot cargo, and insurance pay triple benefits for drivers who engage in hazardous work such as providing pickup and delivery service where strikes are in progress.

The "Protection of Rights" clause was first included in the New York-New Jersey agreement signed last year. It was revised to get around the Landrum-Griffith Act's ban on "hot cargo" contracts.

Employees refusing to cross or work behind picket lines, or refusing to handle goods where a labor dispute is in progress are protected from discipline by employers.

When employees "exercise their individual rights" by refusing to cross picket lines, employers are obliged to continue to do business with the struck company—even if it means using other employees or other carriers.

In addition to protection features, health and welfare fund contributions were raised 50¢ a week to $3; pension fund contributions were raised to $4, a $1-a-week boost. Similar increases will go into effect in two years, on Feb. 1, 1963.

Goldberg to Press For Unemployment Pay

Labor Secretary Arthur J. Goldberg has indicated he will press for Federal action to liberalize unemployment benefit payments.

"I have a strong feeling the Federal Government must extend help" to the states for payments to the increasing number of jobless workers," he said last week.

Meanwhile, the Labor Dept. reported that the number of workers receiving unemployment benefit payments under state unemployment insurance programs jumped to 3,289,600 during the week ended Jan. 7, compared with 3,060,700 the previous week. A year ago, the figure was 2,173,800.

Fewer Rail Workers

Railroad employment in December, 1960, fell to its lowest level since before the turn of the century, according to G. E. Leight, chairman of the Railway Labor Executives' Assn. He says 734,000 workers were on the job and 150,000 were on layoff.

House Gets Common Site Picket Bill

The bill to permit picketing at construction sites where several contractors are working has started making its way through Congress.

The "common site" picketing bill, introduced by Rep. Frank Thompson, Jr. (D., N. J.), has the backing of the Kennedy Administration.

Rep. Thompson says it would require a 10-day cooling-off period before any work stoppage could take place. It would apply to construction projects at military bases or launching sites for missiles or space vehicles.

Hoffa: Labor Bill Changes

Teamster President J. R. Hoffa predicts three parts of the Landrum-Griffin Labor Law will change during the Kennedy Administration:

(1) A clause requiring a union official to have a bond with a bonding company designated by the Federal Government; (2) A rule against secondary boycotts; (3) Simplification of an accounting requirement Hoffa says costs an average of $3000 a year.

He made the prediction at a Detroit meeting of Teamster Local 247 to elect officers and end an eight year trusteeship of the local.

Mr. Hoffa said the AFL-CIO won't ask for changes in the bill this year "because they've been told by Kennedy he won't modify the law." He said the AFL-CIO "sold out the American labor movement by not having the guts and courage to fight anyone who is against us."

Mr. Hoffa said his official attitude toward President Kennedy is "wait and see," but he'd personally "continue to give him hell," although some other Teamster leaders want to soften union sniping at Mr. Kennedy.

Local 247 is the last local under trusteeship to select its own officers. According to the Teamster chief, the union has met every provision set by a Federal court judge to regain its autonomy from a court-appointed board of monitors. He thinks the court will let the Teamsters hold a convention and elect national officers in April or May.

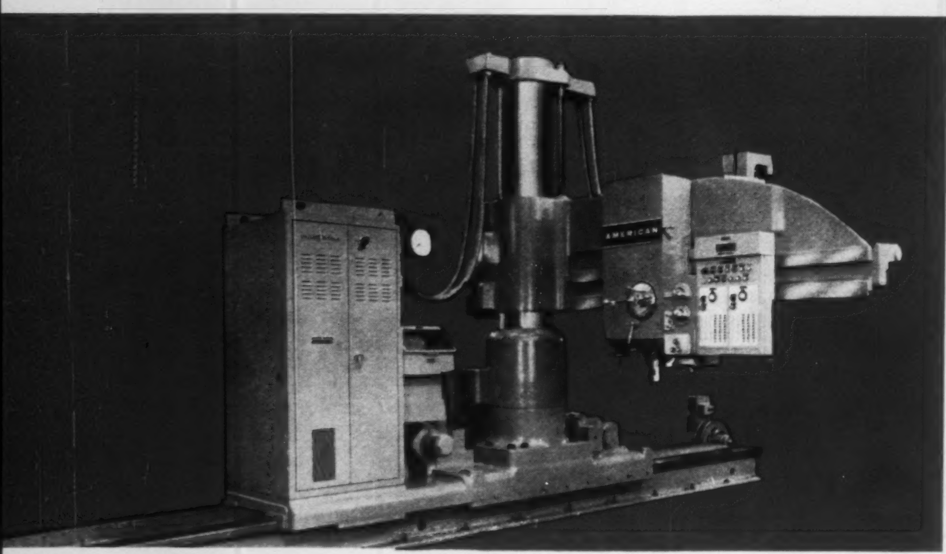
Local 247 was put in trusteeship in 1953 when a grand jury investigation led to the conviction of its president and business agent on charges of extortion and conspiracy to accept bribes from contractors.

There's nothing in the world like this new AMERICAN Numerically Controlled Traveling 19" Column

OPENSIDE BORING AND DRILLING MACHINE

It's big.

But this traveling, openside timesaver relishes small jobs in separate work stations, too. Work can be machined anywhere within the huge working area. Precise location of holes is established simply by a General Electric control system using 1", 8-channel tape without jigs or layout. Machine positions by tape control on both X (saddle) and Y (head) axes, or the machine may be positioned by keyboard for one-of-a-kind jobs. Full zero shift, too. Big as it is, this American beauty does very precise boring. Ask for Bulletin 813-A.



- BORING
- DRILLING
- REAMING
- TAPPING

This and all other AMERICAN machine tools are available on "Toolease", American's own leasing plan.

COMPETE COMPETENTLY WITH

AMERICAN

LATHES • RADIAL DRILLS
SPECIAL MACHINES

The American Tool Works Company

Pearl Street at Eggleston Avenue • Cincinnati 2, Ohio

WASHINGTON

Metalworking Newsfront 3

By R. W. Crosby

★ Navy Explains Foreign Buys

The U.S. Navy says it is just following the rules in buying foreign steel and aluminum for use in government shipyards.

After a quick investigation of use of foreign-produced metals in Navy shipyards, following complaints from Congress, Navy officials set down three buying provisions in defense of the metal purchases. They are:

The Buy American Act, giving domestic producers preference over foreign suppliers.

A 1954 executive order which sets a 6 pct differential in determining whether the domestic price is unreasonable.

The Armed Services Procurement Regulation, which permits the use of a 12 pct differential where the domestic supplier is a small business firm or a firm that will produce substantially in a labor surplus area.

The Navy says "all procurements of steel and aluminum of foreign origin have been made in strict accordance" with these provisions.

The controversy over use of foreign-produced metals started when Sen. Thomas H. Kuchel (R., Cal.), complained that the Mare Island, Cal., Naval shipyard had stocked "a considerable quantity of stainless steel and aluminum sheets from abroad."

Sen. Kuchel believes this is against the best interests of U.S. metal producers.

■ Hot Debate Likely On Depressed Area Aid

The battle lines are being drawn on Federal aid to depressed areas. The deluge of varying depressed area bills in Congress makes a battle royal imminent.

The battle, though mainly political, will also be fought along geographic and economic lines. In the end the Democrats will have a comparatively united front. It should be enough to meet the priority rating given depressed areas by President Kennedy.

Two among the dozens of depressed areas bills seem to be the main contenders. They are S.1, introduced by Sen. Paul Douglas (D., Ill.), and S.9, introduced by Sen. Everett Dirksen (R., Ill.).

The Douglas bill is similar to the one former President Eisenhower vetoed last year. Sen. Dirksen's bill is the same as the one Eisenhower wanted.

S.1 calls for $375 million in Federal assistance. S.9 seeks about $75 million direct assistance with some fund increases in already operating programs. S.1 and S.9 vary in many ways. So do the other bills.

■ Pending Bills Would Affect Metalworking

Much publicized legislation in Congress, like bills for minimum wage increases, depressed area aid, and home and school construction, often obscure unsung bills which could have important ramifications. Here are a few being considered by Congress which are of particular interest to the metalworking industry:

H.R. 2210—A bill to create a U.S. Department of Mineral Resources.

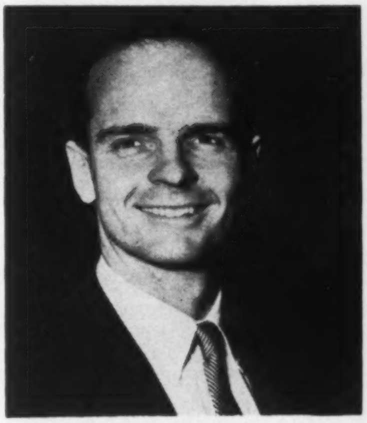
H.R. 2225—A bill to require government contractors to name their subcontractors and to quote contract, material and supply prices.

H.R. 2418—A bill calling for more competition in procurement by the armed services.

■ House Opposition To Spending Grows

President Kennedy's legislative program is hitting new snags in important places in Congress.

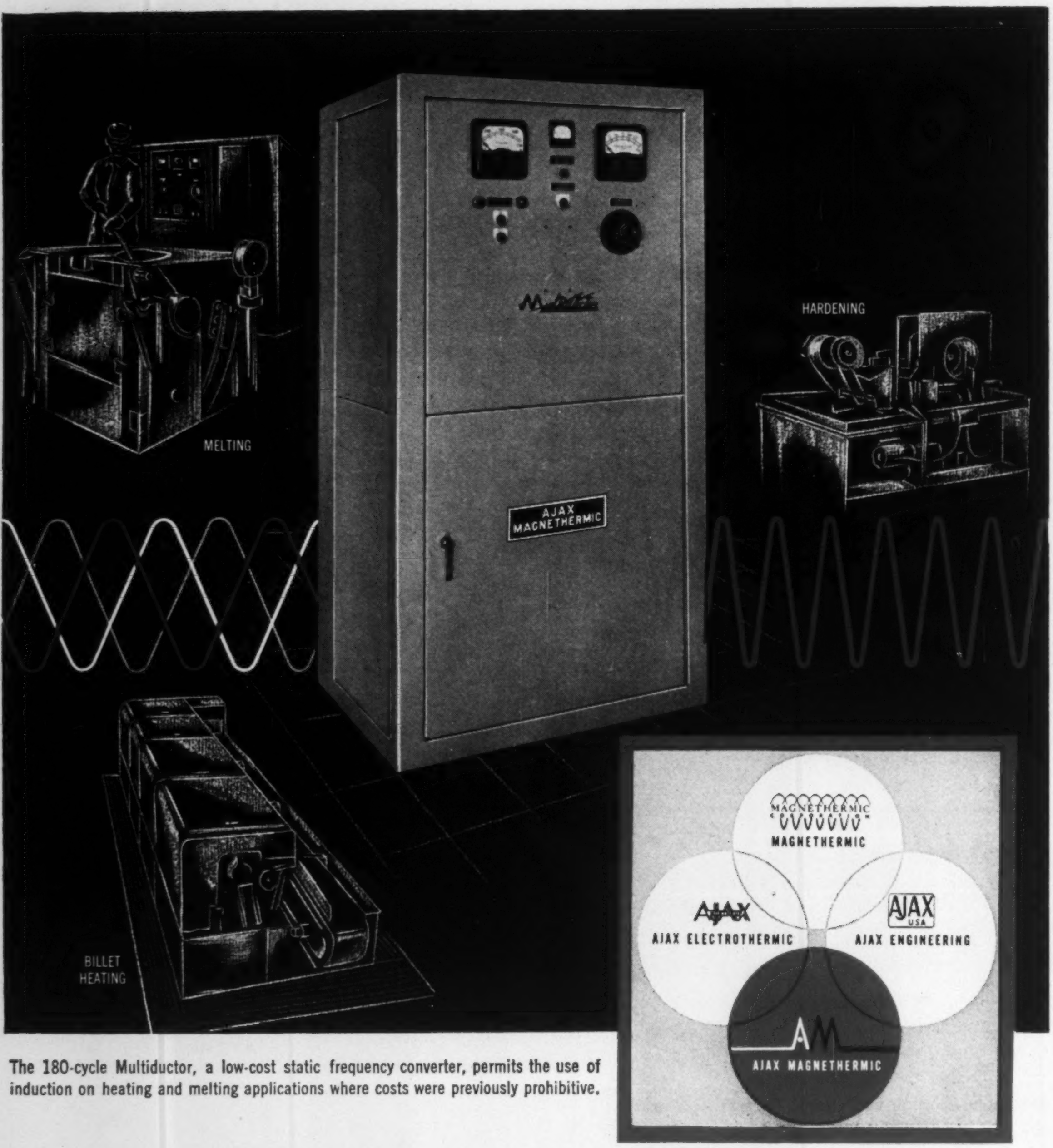
The main trouble is in the House where opposition to big spending is growing. Indicative of the problem is the tough time Democratic leaders are having trying to control the conservative coalition. Other things which point up the problem:



Proxmire: He's opposed.

Democratic Sen. William Proxmire, (Wis.), denounces the idea of using government spending as an anti-recession move. Sen. Proxmire says recommendations to spend $3 to $5 billion to stimulate the economy "could lead to unnecessary, unwise spending and inflation."

Republican leaders forecast firm opposition to many proposed outlays of Pres. Kennedy's "new frontier" program. They say the House will resist adding Federal aid for teachers' salaries to school construction funds. They believe the House will stick to the 15¢ boost in the minimum wage.


MELTING
HARDENING
BILLET HEATING
AJAX MAGNETHERMIC
MAGNETHERMIC
AJAX ELECTROTHERMIC
AJAX ENGINEERING
AM
AJAX MAGNETHERMIC

The 180-cycle Multiductor, a low-cost static frequency converter, permits the use of induction on heating and melting applications where costs were previously prohibitive.

THE NAME WITH THE FAMILIAR RING!

The Multiductor, one of several Power Sources . . . another major product line of AM for the heating or melting of metals by Induction.

"induction heating is our only business"

Ajax Magnethermic
CORPORATION

GENERAL OFFICES
P. O. BOX 839
Youngstown 1, Ohio

TRENTON DIVISION
930 Lower Ferry Road
Trenton 5, New Jersey

YOUNGSTOWN DIVISION
3990 Simon Road
Youngstown 1, Ohio

British Automakers Remain Optimistic

British automakers remain optimistic despite trying times in their industry.

More than one-fourth of the auto workers in Great Britain have been directly hit by the recession. English Ford has gone on a three-day week. At Crowley, Oxfordshire, 1800 Morris Motors employees are on a two-and-one-half day schedule. Two-thirds of the British Motor Corp.'s work force is on short time.

Manufacturers are not anxious to lose skilled men and have cut schedules in preference to direct layoffs. But most feel a change is in the wind and production should soon start to rise. Ford, for example, looks for a definite improvement within the month.

The New Type Industrial Hero

Newest industrial hero: "The last man out of Cuba."

U. S. businesses which operated Cuban-based plants are now telling of the undercover work that was necessary to rescue skilled supervisors and plant managers from Fidel Castro's clutches.

One big metalworker had 20 U. S. citizens training Cuban workers to take over a large plant there. The "teachers" began showing up at airports — minus luggage — while airlines were still operating. One supervisor was thus shipped backed to this country each day.

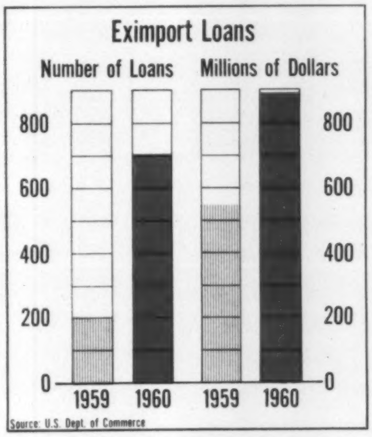
At last report, only the supervisor of the entire operation remained. Now he's dropped out of sight.

Eximbank Loans Were Increased in 1960

The Export-Import Bank's annual report for 1960 shows an increase over 1959 of 504 loans and dollar gains of $345 million.

The 1960 totals: Seven hundred and twelve loans amounting to $897 million. This is compared to 1959's 208 loans totalling $552 million.

Eximbank says 1960's loans will assure the financing of nearly 73,000 individual export orders with a total invoice value of nearly $1 billion. A bank spokesman also notes that, due to improved economic conditions abroad, fewer balance-of-payment loans were made in 1960.



Source: U.S. Dept. of Commerce

Loans to Latin American countries soared in 1960, according to the report. A total of 285 credits were approved for this area for $384 million—an increase of more than 325 pct over 1959 in the number of credits authorized.

Foreign Tax Loopholes Closed

The Internal Revenue Service is cracking down on possible tax evasion by businesses through fake foreign subsidiaries. Revenue officials claim some U. S. firms are setting up "paper" subsidiaries in countries with low corporate taxes to beat the tax bite. Earnings by subsidiaries in foreign countries aren't taxable in the U. S. until brought back to the U. S. as dividends.

Solidarity Nears In Common Market

There is a good chance that the European Common Market will come fully into effect by 1966—four years ahead of schedule.

At least this appears to be the feeling that has grown since the meeting of the Council of Ministers of the European Economic Community in Brussels back in December.

However, there are reports that alarm is growing in some industry areas of Britain as the Common Market solidifies. Some of the British feel it may become increasingly difficult to compete within the "finished" Common Market.

Sintering Overseas

Japanese steelmakers are now working on ways and means of using low grade coking coal from the United States in connection with sinter plants. Methods similar to ore reduction are being probed with the help of U. S. metallurgy consultants.

Snags at GATT

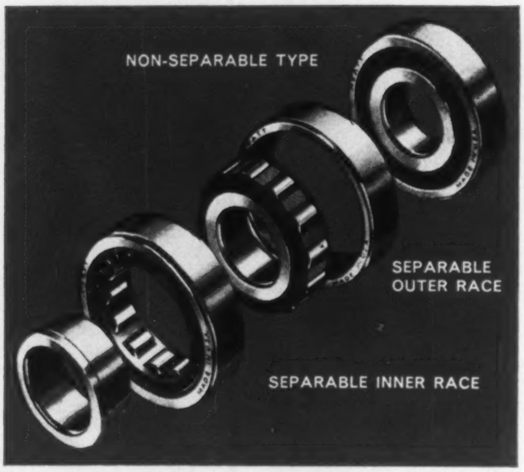
U. S. State Dept. sources say trade negotiations at the General Agreements on Tariffs and Trade (GATT) are hitting unexpected snags.

The first phase of the renegotiation of duties on imports and exports was set to end last December. It is still going on. The second phase is expected to go on into 1962.

More German Steel

Steel production in the Federal Republic of Germany is on the rise. Mills are running at near full capacity and the total volume of steel poured in 1960 will probably reach an all-time high of 34 million metric tons. This year's production is expected to rise another 6 pct there.

YOU GET FIVE IMPORTANT BENEFITS WHEN YOUR "SPECS" READ HYATT



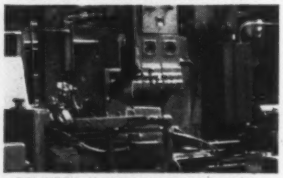
1 RELIABILITY

Hyatt reliability is measured by results. For example, The Hyatt Reliability Program embraces every phase of product development. In procurement, it weeds out all but the highest-grade raw material. In engineering, Hyatt Reliability insures efficient, accurate design. In manufacturing, it provides careful inspection and rigid adherence to specifications. And Hyatt Reliability does not stop there. Hyatt sales engineers work with you to help recommend the best possible bearing for your requirements. Then, they follow up to make sure Hyatt bearings deliver in service. And no one knows more about cylindrical bearings. For over 68 years, Hyatt has produced top-quality bearings for almost every type of application. Check the benefits that are yours when your "specs" read Hyatt.

2

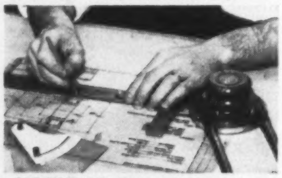
PRICE. Hyatt's advantages of quality, assembly practice and uniformity of product can often reduce over-all cost to you.

3



DELIVERY. Hyatt's unsurpassed production facilities deliver bearings in quantity with maximum speed and economy.

4



ENGINEERING. Hyatt's engineering is backed by the extensive research and engineering facilities of General Motors.

5

SERVICE. Hyatt Sales Engineers are trained bearings specialists who can save you man-hours and dollars.

HYATT ***HY-ROLL BEARINGS***
FOR MODERN INDUSTRY

HYATT BEARINGS DIVISION, GENERAL MOTORS CORPORATION, HARRISON, N. J.

The Society of Plastics Engineers held its 17th Annual Technical Conference last week. Here are a few examples of the progress reported in science and engineering. These top ideas and new plastic products help to solve space-age challenges.

Flex-Strengthened Hinges

Scientists are baffled by molded-plastic hinges that get stronger each time they're used. These molded hinges are made of polypropylene, a tough, lightweight new plastic. They've been subjected to 1,000,000 flexes with no evidence of failure. Repeated flexing actually raises the plastic's tensile strength. The precise reasons for this phenomenon have yet to be determined.

Ductile Coating

Crosslinking furfuryl-alcohol resins produces an improved type of coating. Amino acids serve as the crosslinking agent. This violates theory. But the acids yield a resin which deteriorates at a slow rate. The new resin is flexible. It adheres well to both steel and copper. It also has excellent electrical properties.

Plastic Jet Engines

Reinforced high-temperature plastics may replace metals in jet engines. Operating successfully for 150 hours, a plastic jet-engine housing has logged the equivalent of 75,000 airborne miles. It withstood rotor speeds up to 12,500 rpm. This is the first time such a big, complex plastic part has worked out so well. The plastic used in this part resembles the lightweight corrosion-resistant type used in nose cones.

Guards Against Corrosion

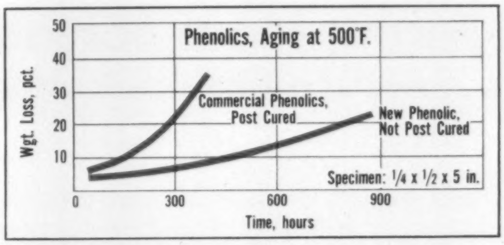
A modified polybutadiene polymer resists abrasion and doesn't become brittle even at –85°F. It also resists the effects of fuels, solvents and chemicals. Used in wires and cables, this polymer precludes the need for different materials in primary insulation and protective sheaths. Other uses: Machine parts where abrasion resistance is important, hose coverings and as a general-purpose coating material.

Features Light Mass

Tiny foamed-plastic spheres have the lowest density of any man-made particles. They can be made from any plastic to almost any desired size. Final compositions can even be colored or metallized. Future uses cover many diverse fields. Possible metalworking applications range from lubricants to thermal insulators.

Phenolic Resists Heat

Thermal stability of phenolic molding materials hinges on their weight loss as a function of heat-aging periods. The best commercial phenolics lose 20 pct of their weight after aging 325 hours at 500°F. A new heat-resistant phenolic lasts 750 hours at 500°F, before losing the same amount of weight. This newcomer may replace many ceramic and metal parts. It boasts light weight and very low cost.



Produce to Order

Use of thermodynamic diagrams may lead to "tailor-made" plastics. So reported J. M. Lupton of Du Pont's Polychemical Dept., at the technical sessions. Mr. Lupton predicts that molecular engineering will permit the production of plastics with specific and predetermined properties. These new plastics will serve in special applications for which they're formulated.

Kennametal Carbide Engineer—Shop Foreman—Machine Operator

3-man team solves machining problem

. . . reduced tool breakage and chip hazard —increased production and cut tool cost 70%

PROBLEM: Excessive tool breakage due to scale, run-outs and erratic tool grinding; dangerous operating conditions due to poor chip control.

SOLUTION: After cooperative study of problem, 3-man team recommended a change to heavy duty Kennametal* throw-away insert tooling with solid Kennametal chipbreakers to eliminate grinding.

RESULT: Increased speed and feed 30%, tool cost reduced from $1.81 to 51 cents per piece, improved chip control, and eliminated all grinding.

That's the kind of product and service that you can get through your Kennametal carbide engineer.

Thoroughly trained in carbide products, he devotes his time exclusively to the sale and application of Kennametal hard carbides . . . and is well qualified to provide on-the-spot analysis and recommendations. If your job requires unusual or special design engineering and application service, your Kennametal man will make our headquarters engineering and manufacturing facilities available.

Depth of on-the-job experience—plus the continuing development of a variety of tungsten, titanium, and tantalum carbide grades—has lead to the use of Kennametal compositions in practically every industry. And our product development group, by working in close cooperation with design engineers, sales engineers, and customers, keeps coming up with new products and new applications—engineered and developed to meet both general and specific customer requirements.

We believe you will be interested in our booklet, "There's Profit in Retiring a Tradition," which gives facts on how some companies have reduced machining costs as much as 70 per cent. Based on actual cases, it makes practical and profitable reading. Ask your Kennametal Carbide Engineer for a copy . . . or write direct to KENNAMETAL INC., Dept. IA, Latrobe, Pa.

*Trademark 33554

INDUSTRY AND
KENNAMETAL
. . . Partners in Progress

LETTERS FROM READERS

Tax Loopholes

Sir—I have noted in The IRON AGE of Dec. 22 an article which may make it appear to the reader from the context that I am opposed to plugging loopholes in present tax laws, a proposal which you attribute to Mr. Stanley H. Ruttenberg in the same article.

I am entirely in favor of plugging loopholes in present tax laws. I am against general tax increases at this time to finance now needed increases in public outlays; these now needed increases in public outlays should be financed out of the increased general tax revenues which would result at existing tax rates from the higher rate of economic growth which this, along with other desirable programs, would help to stimulate.

I am against higher general tax rates at any time when we have vast unused resources of plant and manpower. Increases in general tax rates should be contemplated only to cover additional public outlays undertaken at a time when the economy is operating at virtually full employment of plant and manpower. — Leon H. Keyserling, Washington, D. C.

Ado About Something

Sir—It was most disappointing to read your editorial "Much Ado About Something," concerning the dropping of the capacity rating in the steel industry.

You bewail this action, completely ignoring the factors of this rating having become in actuality a political football for strident politicians and, by its very nature, giving no real comparison with prior years since it is purely an absolute figure. When new capacity is added, the figure changes instantaneously. And it also takes no account of additional tonnage gained from furnaces whose actual "capacity" was set the day they were built.

Your main argument in favor of the rating appeared to be that IRON AGE had originated it decades ago and you appear confident that the capacity rating will return.

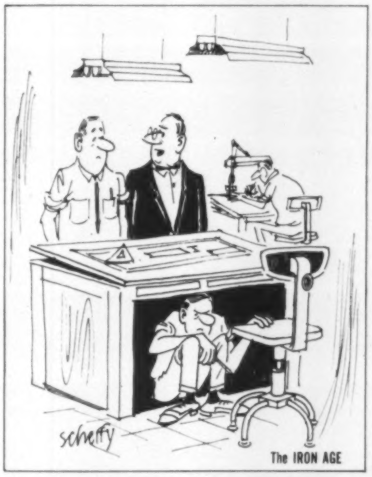
Don't hold your breath, gentlemen. Could it be that the steel industry is moving into a new era, leaving poor old IRON AGE far behind?—Stuart G. Morris, Glen Ellyn, Ill.

Well Expressed

Sir—Your editorial appearing in The IRON AGE recently entitled "Fighting Communism: Why Is it So Difficult?" appealed to me as a particularly well-expressed essay on Communism. This insidious cancer which threatens democracy can not be pointed up too often too strongly.

Will you grant reprint permission to enlarge your "sphere of influence?" I would like to submit your editorial to the "Letters to the Editer" column of the Kansas City, Mo., STAR giving credit to The IRON AGE.—Charles A. Carter, Jr., Bendix Corp., Kansas City, Mo.

■ **Permission granted.—Ed.**



"He's certainly sensitive to criticism, isn't he?"

STANDARDIZE 100%
ON SOUTHERN
FASTENERS

TO MEET YOUR REQUIREMENTS

Do you need top quality fasteners in steel, brass, silicon bronze, aluminum or stainless? Southern Screw is a specialist in meeting your most exacting specifications. And Southern's large plating department in the Statesville plant is at your service to apply quality plating in cadmium, zinc, nickel, or other finishes.

For 100% USA-made fasteners, standardize on Southern for quality and for service. Send us your order or inquiry for standards or specials. Write Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Manufacturing and Main Stock
in Statesville, North Carolina

WAREHOUSES:
New York • Chicago • Dallas • Los Angeles

Machine Screws & Nuts • Tapping Screws • Stove Bolts • Drive Screws Carriage Bolts • Continuous Threaded Studs • Wood Screws • Hanger Bolts Dowel Screws

Southern
SCREW COMPANY
STATESVILLE • NORTH CAROLINA

Don't gamble on lathe work!

Get cost-reducing HYDRASHIFT to insure profits on your present jobs . . . better bids on new jobs

With a Cincinnati HYDRASHIFT, your man can out-produce *any* other lathe operator!* That's because he keeps the machine cutting full time. *He loses no speed-changing time!* And, because it's *easy to change speeds*, he'll use the best RPM for every operation.

HYDRASHIFT is the *only* economy-priced geared head lathe with Power Dial speed shifting! The next desired spindle speed is dialed while the lathe is cutting. At the end of the cut, hydraulic power shifts the speed without the operator leaving the apron.

In addition, HYDRASHIFT has all the other Cincinnati features for speed, accuracy and ruggedness that make it the "most-wanted" lathe in its class!

CINCINNATI
15
102
72
51
37
CINCI
LATHE

*. . . using a comparable lathe within this price class (and many lathes priced much higher).

Ask your Cincinnati Lathe and Tool Distributor for Catalog T-230, or write us direct.

CINCINNATI LATHE AND TOOL CO.
CINCINNATI 9, OHIO
HYDRASHIFT Lathes / CINCINNATI Drilling Machines / SPIROPOINT Drill Sharpener
CINTIMATIC Numerically Controlled Lathes and Drills

FATIGUE CRACKS

Rocky Goes West

Our West Coast Editor Ray Kay was on hand when New York's Governor Nelson Rockefeller recently arrived in Los Angeles.

Ray had an opportunity to interview the Governor, who was there to open his state's new department of commerce office in Los Angeles. (See story, p. 71.)

Usually Ray goes all-out in his enthusiasm for the West. But he managed to temper his civic pride while questioning the eastern governor. And, Ray tells us, he later managed to even things up by interviewing California's Governor Pat Brown.

Politics and Trade — Ray questioned Gov. Rockefeller about talk he's using his state's commerce drive as a springboard for a bid at the presidency in 1964. Not so, said Gov. Rockefeller, the trip had "no political implications." And he was in California only to promote New York State.

Then the conversation switched to world trade. There's a great potential for U. S. industry in the Western Hemisphere, the governor pointed out. In fact, he'd like to see the U. S. use the same approach were it used to develop trade elsewhere in the world.

Over and Under

Though we, as editors, seldom make loud claims to be statisticians, we do pride ourselves on our statistical accuracy. Such was the case when we published the chart entitled "Fact vs. Forecast" in the Jan. 5 issue on p. 208.

In that chart we credit ourselves with an accuracy in prediction of 83.2 pct for the metalworking machinery industry and 98.8 pct for general industrial machinery. In both cases we UNDERESTIMATED the actual shipments in 1960.

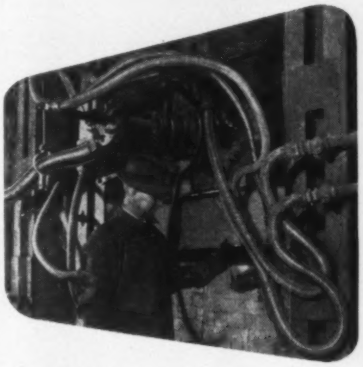
However, this week Irving P. Davies, district sales manager, Allegheny Ludlum Steel Corp. writes to us and asks: "Could it be that your accuracy slip is showing?" He notes, ". . . you are more accurate than you take credit for."

We maintain that it's just as wrong to over-estimate as it is to under-estimate. This is our feeling; statisticians may disagree.

216
STATE OF NEW YORK
DEPARTMENT OF COMME
KEITH S. ME
COMMISSIONER
ROBERT A. LO
DIRECTOR

EAST MEETS WEST: Ray Kay, IRON AGE West Coast Editor, (left), greets New York's Gov. Nelson Rockefeller in Los Angeles. The Governor was there to open his state's new Farwest office of commerce. (See above.)

FLEXIBILITY
THAT STANDS HEAT
. . . ROUGH WEAR



PENFLEX
FLEXIBLE TUBING
FOR FUEL LINES . . .
COOLING LINES . . . AIR LINES

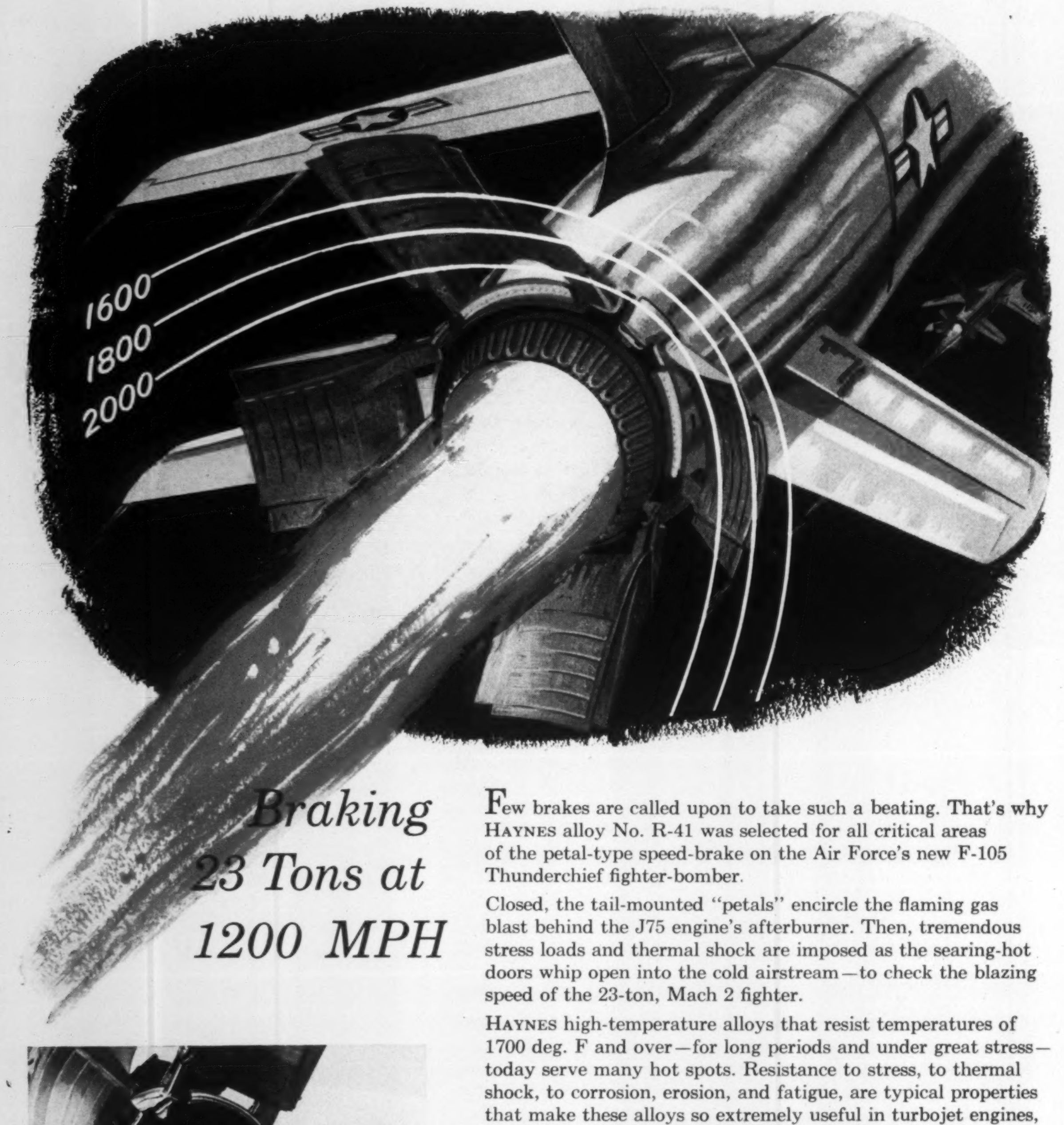
Throughout steel mills from coast to coast they are relying on Penflex Tubing where the heat is high and the going tough.

Fuel lines and cooling lines on open hearth atomizers . . . oxygen and water lines on the lance in the oxygen process . . . air lines and diesel exhausts in the power plants . . . water feed lines on rolls . . . and in many other places Penflex is being specified. Penflex metal hose—corrugated and interlocked—absorbs any pipe movement due to extreme temperatures and pressures. Provides outstanding safety and uninterrupted flow of fuels, gases and volatiles. It is leakproof, tough and flexible. Write today for complete details of Penflex Tubing for the steel industry to . . .

PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY
Paoli, Pa.

Penflex

TIGHT AS A PIPE . . . BUT FLEXIBLE



Braking 23 Tons at 1200 MPH

Few brakes are called upon to take such a beating. That's why HAYNES alloy No. R-41 was selected for all critical areas of the petal-type speed-brake on the Air Force's new F-105 Thunderchief fighter-bomber.

Closed, the tail-mounted "petals" encircle the flaming gas blast behind the J75 engine's afterburner. Then, tremendous stress loads and thermal shock are imposed as the searing-hot doors whip open into the cold airstream—to check the blazing speed of the 23-ton, Mach 2 fighter.

HAYNES high-temperature alloys that resist temperatures of 1700 deg. F and over—for long periods and under great stress—today serve many hot spots. Resistance to stress, to thermal shock, to corrosion, erosion, and fatigue, are typical properties that make these alloys so extremely useful in turbojet engines, in ramjets, missiles, rockets, manned space capsules.

Whether investment- or sand-cast, rolled, wrought, vacuum melted, or air melted, there's a HAYNES high-temperature alloy to meet your needs.

Mechanic adjusts hinge of speed-brake door whose critical parts are of HAYNES alloy No. R-41.

HAYNES
ALLOYS
HAYNES STELLITE COMPANY
Division of Union Carbide Corporation
Kokomo, Indiana

UNION CARBIDE

Address inquiries to Haynes Stellite Company, 270 Park Avenue, New York 17, N. Y.

"Haynes" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

COMING EXHIBITS

International Heating & Air-Conditioning Show—Feb. 13-16, International Amphitheatre, Chicago. (International Exposition Co., 480 Lexington Ave., New York 17.)

MHI Pacific Coast Show—Feb. 22-24, Cow Palace, San Francisco. (Material Handling Institute, Inc., One Gateway Center, Pittsburgh 22.)

Western Metal Show — March 20-24, Pan Pacific Auditorium, Los Angeles. (American Society for Metals, Metals Park, Novelty, O.)

National Packaging Show — April 10-13, Lakefront Exposition Hall, Chicago. (American Management Assn., 1515 Broadway, Times Square, New York 36.)

Powder Metallurgy Show — April 24-26, Hotel Sheraton-Cleveland, Cleveland. (Metal Powder Industries Federation, 60 E. 42nd St., New York.)

Castings Show—May 8-12, Brooks Hall, San Francisco, Calif. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Design Engineering Show — May 22-25, Cobo Hall, Detroit. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

MEETINGS

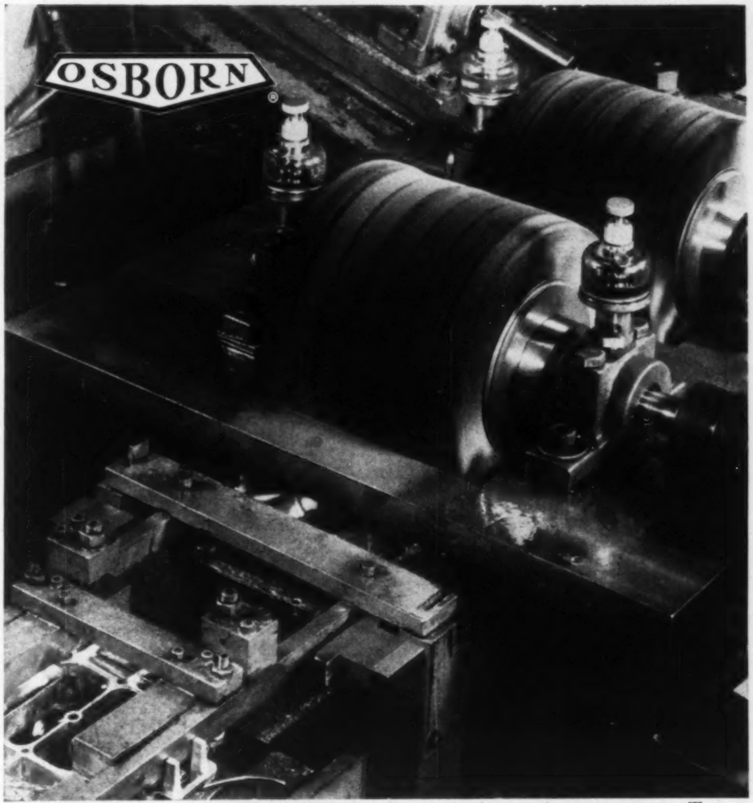
FEBRUARY

American Foundrymen's Society—Wisconsin regional foundry conference, Feb. 9-10, Hotel Schroeder, Milwaukee. Society headquarters, Golf & Wolf Rds., Des Plaines, Ill.

National Assn. of Manufacturers—Meeting, Feb. 15-17, The Riviera Hotel, Palm Springs, Calif. Association headquarters, Two E. 48th St., New York.

The Metallurgical Society of AIME—Annual meeting, Feb. 26-Mar. 2, Ambassador and Chase-Park-Plaza

(Continued on P. 24)



AUTOMATIC FLASH REMOVAL SETUP for die-cast zinc carburetor parts. Two brushing heads—each made up of seven Osborn Master® Wheel brushes—are mounted over the conveyor. Parts (shown fixtured in lower left corner) pass under brushing heads where all flash is removed as they travel to next work station.

OUTPUT TRIPLED from 200 to 600 an hour with OSBORN power brushing

Before: this auto equipment maker was using costly off-hand methods to remove flash from these die-cast zinc carburetor parts. Production was slow . . . it varied from shift to shift, averaging about 200 pieces per hour.

Now: parts are Osborn power brushed clean as they travel between work stations by conveyor . . . *eliminating manual handling*. The setup of Osborn Master® Wheel brushes does the job at rates up to 600 pieces per hour . . . *three times as fast*. The operation is simple, inexpensive. Results are uniform, with excellent quality control.

This application is typical of how *your* tough metal finishing problems of every description—deburring, cleaning, polishing, precision blending—can be solved with today's Osborn power brushes and brushing methods. An **O**sborn **B**rushing **A**nalysis—made at no obligation in your plant now—is the first step. Write or call *The Osborn Manufacturing Company, Dept. F-106, Cleveland 14, Ohio. Phone ENdicott 1-1900.*

Osborn Brushes

Metal Finishing Machines . . . and Finishing Methods
Power, Paint and Maintenance Brushes • Foundry Production Machinery

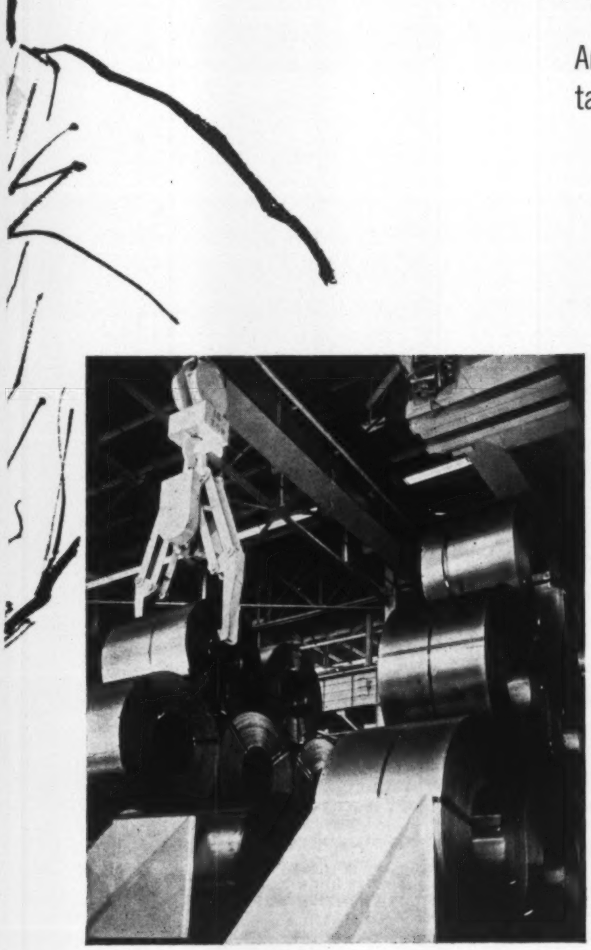
New steels are
born at
Armco

Steel

This mark tells
customers you use
sturdy, dependable steel

First the part...
Then the Armco Steel

Armco metallurgists **start** with study of the part—then tailor hot-rolled and cold-rolled steels to exact needs



How is the part designed? What's its function? What kind of service does it face? How and on what equipment is it made?

These are a few of the questions Armco metallurgists ask before a pound of steel is made for a customer's new product or part. The sum total of the answers forms a pattern that is translated into a production "routing"—the step-by-step program under which Armco Hot-Rolled and Cold-Rolled Steels are made and processed to meet specific fabrication and service needs. But the metallurgists don't stop there. Once a routing is approved, they double-check each succeeding order to make sure there's no deviation.

Performance records in hundreds of metalworking plants testify to the results. Armco Hot-Rolled and Cold-Rolled Steels not only show high performance, but *consistent, predictable* performance, from sheet to sheet and order to order. In fact, in many plants these Armco steels are looked upon as "standards of high quality."

Price, delivery and technical information on these hot-rolled and cold-rolled steels are quickly available from your nearby Armco Sales Office or by writing Armco Division, Armco Steel Corporation, 1141 Curtis Street, Middletown, Ohio.

ARMCO **Armco Division**

NEW LENOX
MASTER-BAND
ALLOY STEEL
BAND SAW BLADE

Dramatic increase in blade life, cutting rate, and square inches of cutting per blade!

This special alloy steel band saw blade with the Lenox True-Weld, substantially reduces cutting costs by cutting at a faster rate, eliminating several blade changes, increasing square inches of cutting per blade, and by cutting tougher steels.

Master-Band is designed and engineered for *both* conventional and automatic machines, with an immediate 25% savings in blade cost on automatic cut-off equipment.

LENOX
Master-Band
(SPECIAL ALLOY)

Master-Band IS DESIGNED FOR THESE STANDARD BAND SAW MACHINES

JOHNSON • LAIDLAW • MARVEL
KALAMAZOO • DoALL • NAPIER
GROB • WELLS • W. F. WELLS
• AND OTHERS

AND THESE AUTOMATIC CUT-OFF MACHINES

DoALL • MILBAND-THOMPSON
MARVEL • PEERLESS • WELLS
• KALAMAZOO • AND OTHERS

Write for performance guaranteed trial order or call your industrial distributor.

LENOX
THE TOOLS IN THE PLAID BOX

AMERICAN SAW & MFG COMPANY
SPRINGFIELD, MASSACHUSETTS, U.S.A.

MEETINGS

(Continued from P. 21)

Hotels, St. Louis. Society headquarters, 29 West 39th St., New York.

Assn. of Iron & Steel Engineers—Western meeting, Feb. 27-Mar. 1, Hotel Statler, Los Angeles. Association headquarters, 1010 Empire Bldg., Pittsburgh.

MARCH

Malleable Founders Society—Technical and Operating conference, Mar. 1-2, Pick-Carter Hotel, Cleveland. Society headquarters, 781 Union Commerce Bldg., Cleveland.

Can Manufacturers Institute, Inc.—Annual & board meeting, Mar. 6, Waldorf-Astoria, New York. Institute headquarters, 821 15th St., N. W., Washington, D. C.

Steel Founders' Society of America—Annual meeting, Mar. 11-14, Drake Hotel, Chicago. Society headquarters, 606 Terminal Tower, Cleveland.

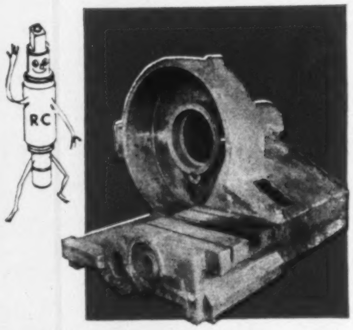
Industrial Diamond Assn. of America, Inc.—Annual meeting and convention, Mar. 13-17, Hollywood Beach Hotel, Hollywood, Fla. Association headquarters, Box 175, Pompton Plains, N. J.

Society for Non-Destructive Testing—Western regional convention, Mar. 20-24, Ambassador Hotel, Los Angeles. Society headquarters, 1109 Hinman St., Evanston, Ill.

American Hot Dip Galvanizers Assn., Inc.—Annual meeting, Mar. 22-24, The Royal Orleans, New Orleans. Association headquarters, 5225 Manning Place, N. W., Washington, D. C.

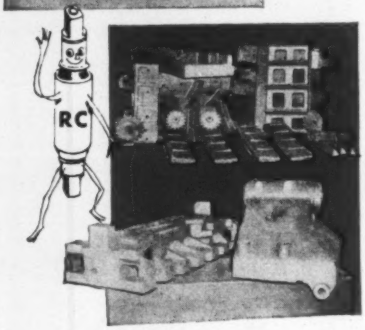
Pressed Metal Institute — Spring technical meeting, Mar. 22-24, New York. Institute headquarters, 3673 Lee Rd., Cleveland.

American Machine Tool Distributors Assn.—Spring meeting, Mar. 23-25, Hotel Mark Hopkins, San Francisco. Association headquarters, 1500 Massachusetts Ave., N. W., Washington, D. C.



Gray Iron and Alloy Iron Castings
Up to 80,000 Pounds

RED CIRCLE Rolls ALLOY-CHILLED

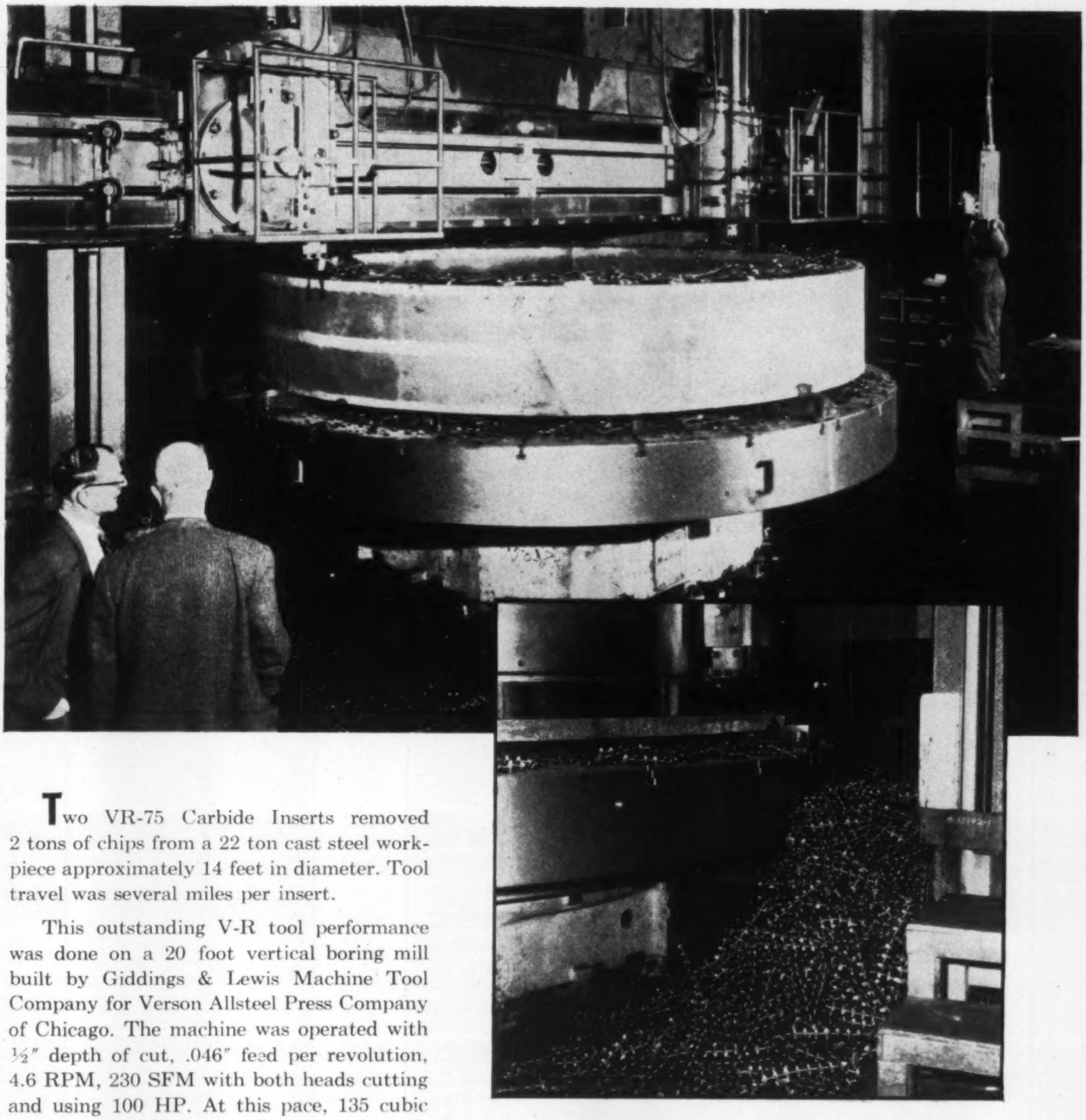


Our foundry and machine shop facilities are equal to any of your requirements.

Furnace Castings
Machinery Castings
Heavy Die Castings
Heavy Tool Castings
Slag Pots — Bases
Housings
Floor Plates

Hyde Park
FOUNDRY AND MACHINE CO.
HYDE PARK
Westmoreland
County, Penna.

Rolls
Rolling Mill Equipment
Gray Iron Castings



Two VR-75 Carbide Inserts removed 2 tons of chips from a 22 ton cast steel workpiece approximately 14 feet in diameter. Tool travel was several miles per insert.

This outstanding V-R tool performance was done on a 20 foot vertical boring mill built by Giddings & Lewis Machine Tool Company for Verson Allsteel Press Company of Chicago. The machine was operated with ½″ depth of cut, .046″ feed per revolution, 4.6 RPM, 230 SFM with both heads cutting and using 100 HP. At this pace, 135 cubic inches of metal were removed per minute. A finishing cut followed using 8 RPM, 360 SFM with .023″ feed per revolution.

Such successful case histories are not unusual at Vascoloy-Ramet. V-R's exceptional carbide quality will give you the same outstanding service. Call your V-R man in today, or write for a fully illustrated catalog.

4,000 pounds of chips removed with only two VR-75 Carbide Inserts

V-R

CREATING THE METALS THAT SHAPE THE FUTURE

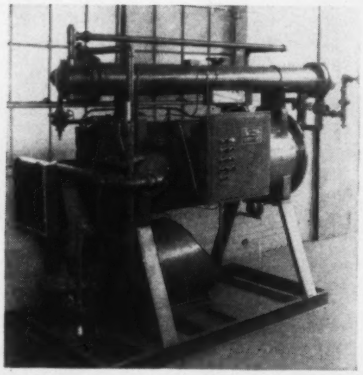
VASCOLOY-RAMET

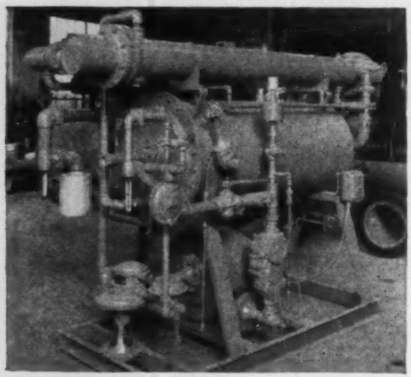
858 MARKET STREET • WAUKEGAN, ILLINOIS

C-815

Which of these 3 KEMP GAS GENERATORS *do you need in your plant?*

1 KEMP INERT GAS GENERATOR ➔
—for working non-ferrous metals. Produces inert gases for use at low or high pressure, desiccated or unprocessed. Kemp gives you low-cost gas generation, completely automatic operation. Premixing in exclusive Kemp Carburetor and constant analysis assures highest thermal efficiency.

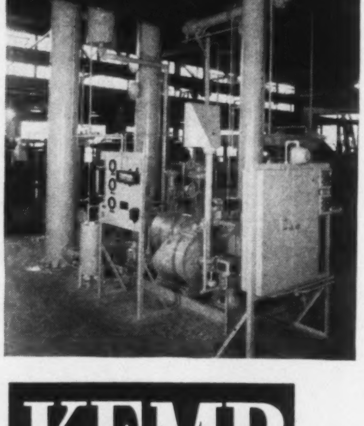




➔ **2 KEMP ATMOS GAS GENERATOR**
—for working low-carbon steels. For gases low in carbon dioxide. As in all Kemp Gas Generators, test burner permits checking for proper combustion characteristics before igniting burners. Another safety feature: automatic fire-checks guard against flashback.

3 KEMP NITROGEN GENERATOR ➔
—for working high-carbon steels. Completely eliminates CO_2 from gas, produces 99+% nitrogen. Features the easy start-up typical of all Kemp Generators. Vernier dial can be locked in position to maintain exact fuel-air ratio without further control manipulation.

The Kemp representative in your area can advise you on the type and size of generator to best solve your problem. Talk to him or write: The C. M. Kemp Manufacturing Company, 405 E. Oliver St., Baltimore 2, Maryland.



It always pays to come to

KEMP
OF BALTIMORE

THE C. M. KEMP
MANUFACTURING COMPANY
405 E. Oliver St., Baltimore 2, Md.

Spotlights on standards . . .

*the four American Presidents, carved out of the mountainsides, set standards which contemporary "public servants" might well emulate. This scene is particularly awe-inspiring at dusk, **spotlighted** by Crouse-Hinds, manufacturers of industry's standards in special purpose lighting, explosion-proof electrical equipment enclosures, traffic control equipment, and world-famous condulets.*

30 YEAR OLD MEAKER "AUTOMATIC" PLATES 65-70 TONS OF PRODUCTS EVERY EIGHT HOURS AT CROUSE-HINDS CO.

In operation for over 30 years, the MEAKER AUTOMATIC at Crouse-Hinds, Syracuse, New York, turns out 65-70 tons of zinc plated condulets every eight hours. What's more, no down time has been recorded in all these years as the fault of the machine.

Reports Mr. Floyd Quinn, Plating Foreman: "Our MEAKER was installed in 1929 to handle condulets up to ¾" diameter. We have been processing from ⅜" *up to 6" diameters for years,* with no modification to the equipment." That's versatility!

No wonder Mr. Quinn adds: "If we were to install another automatic plater tomorrow, we'd insist on a MEAKER with little change from the one we have."

MEAKER has been building automatic processing equipment for continuous or batch type metal finishing since 1899 . . . from "compact-a-matic" units occupying minimum floor space and for limited production requirements—to the world's largest automatic plating installation which occupies over 180,000 square feet and produces 4½ acres of plated surface every 16 hours.

Our catalog "WHEN TO AUTOMATE" will give you some valuable ideas for improving. profits through automatic plating or metal finishing

SINCE
MEAKER
1899

THE MEAKER COMPANY

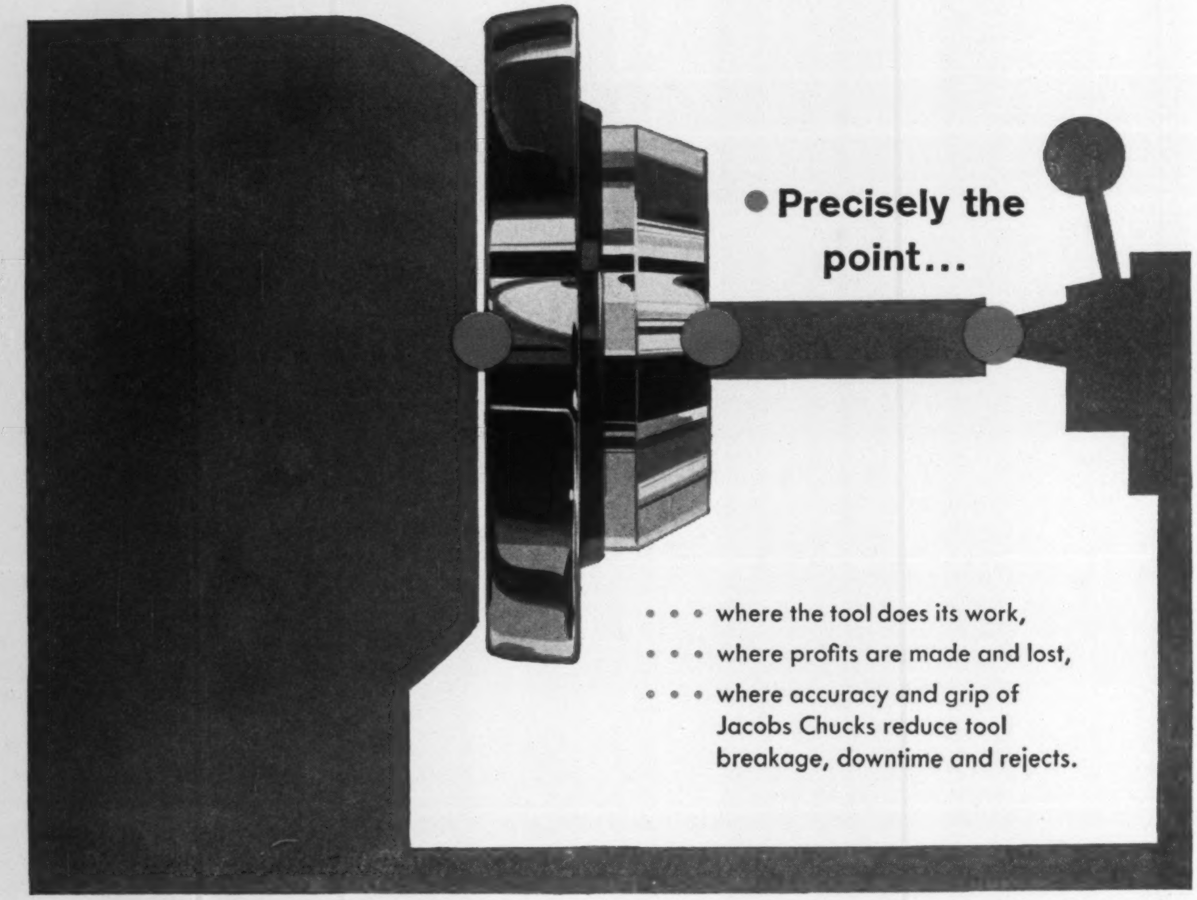
SUBSIDIARY OF SEL-REX CORPORATION

Nutley 10, New Jersey

Factories and offices Chicago 50, Ill., Los Angeles, Cal. and Nutley 10, N. J.

When you buy new tools or four factors come first

ACCURACY GRIP



● **Precisely the point...**

- • • where the tool does its work,
- • • where profits are made and lost,
- • • where accuracy and grip of Jacobs Chucks reduce tool breakage, downtime and rejects.

The Jacobs Model 50 is the world's most modern collet chuck. Model 50 and its entirely new series of Jacobs Rubber-Flex collets have been developed especially for Atlas, Clausing, Delta, Logan, Sheldon, South Bend and similar lathes. With Model 50 on your lathe you get a lot more for less.

ACCURACY is greater with Model 50 because collet jaws are always parallel and maximum runout is .001″ T. I. R. at the nose, when properly mounted.

GRIP is greater because the extra long collet jaws have tremendous torque capacity.

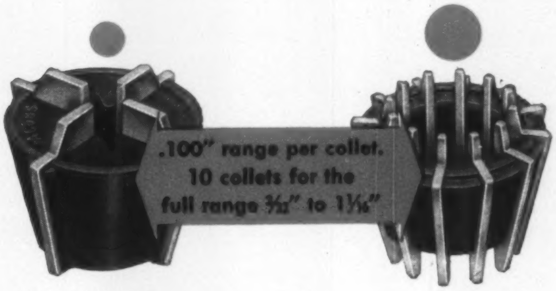
modernize your old ones at the chucking end

RANGE PRICE

COMPLETE SET OF 10 RUBBER-FLEX COLLETS CHUCK ANY BAR BETWEEN

3/32" and 1 1/16"

RANGE is greater because the 10 Rubber-Flex collets in this new series cover a greater bar stock range than **63 old-fashioned split steel collets . . .** .100" range per collet.



PRICE is revolutionary!

\$70.00	**\$65.00**
Model 50 Collet Chuck	Complete set of 10 Rubber-Flex Collets

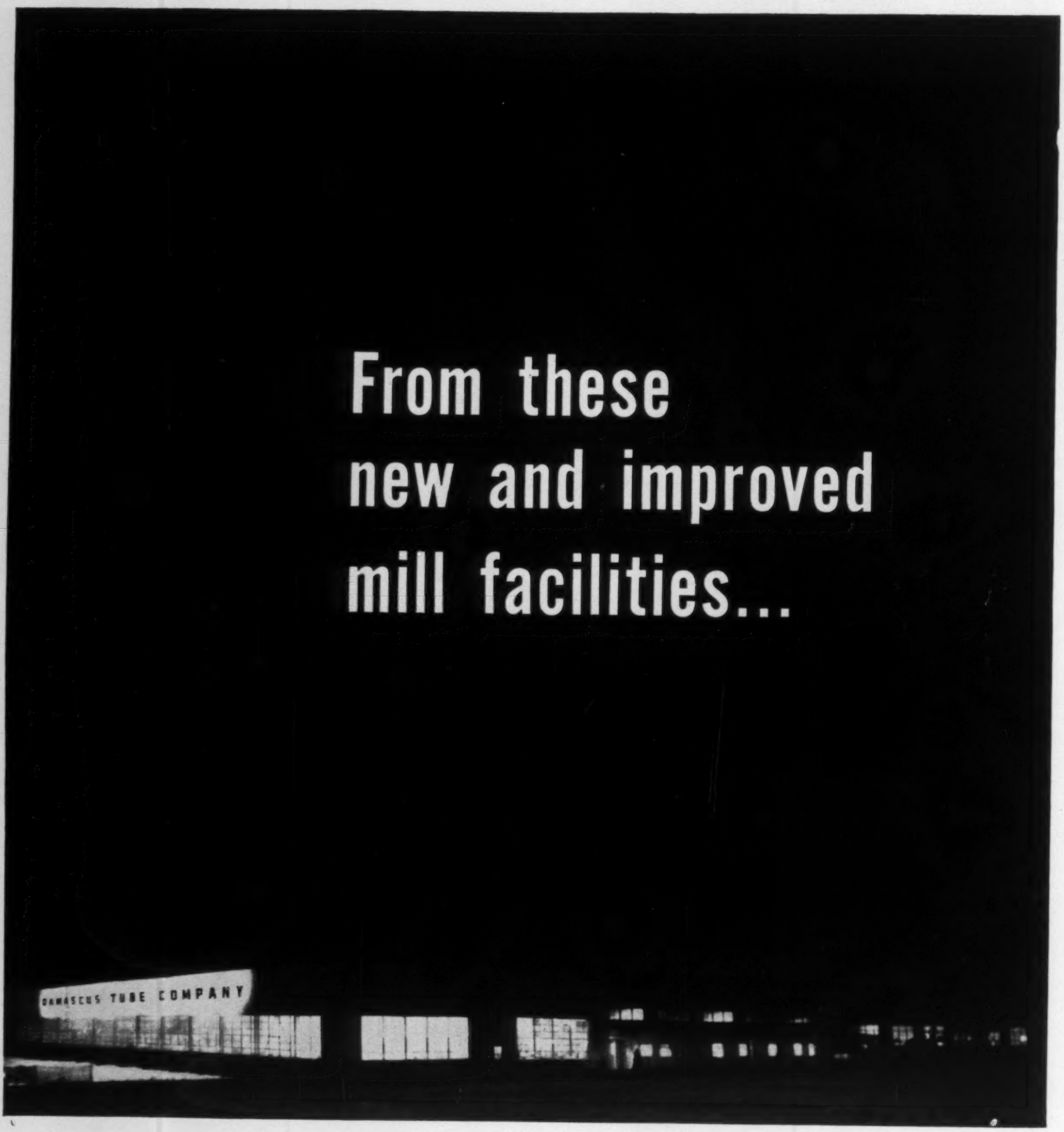
This performance at these prices proves the point. You can't afford not to modernize your lathes with Jacobs Model 50 and Rubber-Flex collets.

See your Jacobs industrial supply distributor. Give him the opportunity to prove the facts with a demonstration at your desk! Call him today. If you'd like further details before you call, write Jacobs, Department 196 at the address below.

Jacobs CHUCKS

INDUSTRIAL DISTRIBUTORS
SERVING INDUSTRY ECONOMICALLY
THE RIGHT HAND OF PRODUCTION

THE JACOBS MANUFACTURING COMPANY,
WEST HARTFORD, CONNECTICUT



From these new and improved mill facilities...

..quality welded stainless steel tubing and pipe

TUBING: ½″ O.D. x .022 wall to 3″ O.D. x .148 wall

PIPE:	Schedule 5	⅛″ I.P.S. to 2½″ I.P.S.
	Schedule 10	⅛″ I.P.S. to 2½″ I.P.S.
	Schedule 40	⅛″ I.P.S. to 2″ I.P.S.

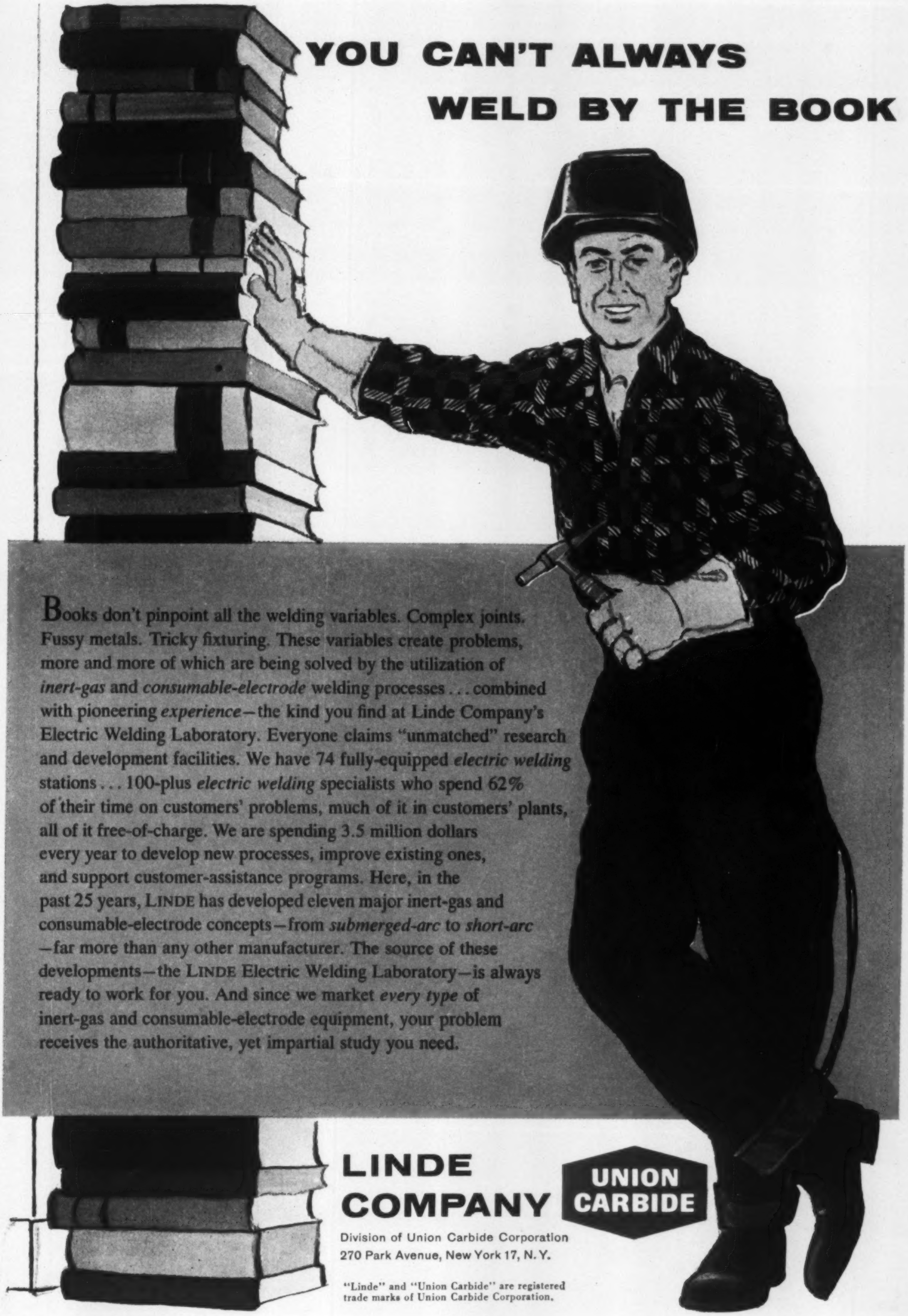
STEEL SERVICE CENTER INSTITUTE

DAMASCUS TUBE COMPANY

STAINLESS STEEL TUBING AND PIPE
GREENVILLE, PENNSYLVANIA

Steel

YOU CAN'T ALWAYS WELD BY THE BOOK



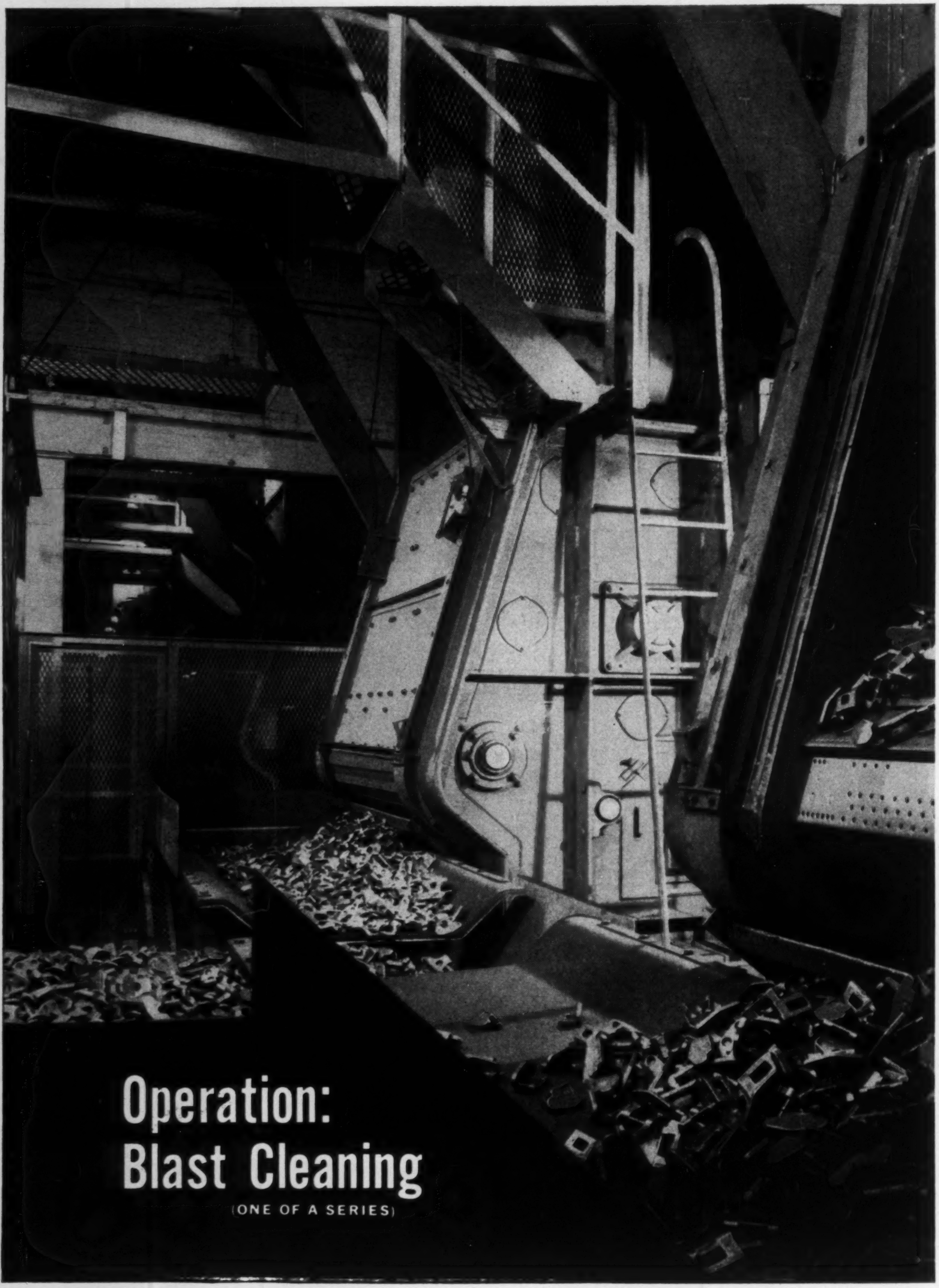
Books don't pinpoint all the welding variables. Complex joints. Fussy metals. Tricky fixturing. These variables create problems, more and more of which are being solved by the utilization of *inert-gas* and *consumable-electrode* welding processes . . . combined with pioneering *experience*—the kind you find at Linde Company's Electric Welding Laboratory. Everyone claims "unmatched" research and development facilities. We have 74 fully-equipped *electric welding* stations . . . 100-plus *electric welding* specialists who spend 62% of their time on customers' problems, much of it in customers' plants, all of it free-of-charge. We are spending 3.5 million dollars every year to develop new processes, improve existing ones, and support customer-assistance programs. Here, in the past 25 years, LINDE has developed eleven major inert-gas and consumable-electrode concepts—from *submerged-arc* to *short-arc*—far more than any other manufacturer. The source of these developments—the LINDE Electric Welding Laboratory—is always ready to work for you. And since we market *every type* of inert-gas and consumable-electrode equipment, your problem receives the authoritative, yet impartial study you need.

LINDE COMPANY

UNION CARBIDE

Division of Union Carbide Corporation
270 Park Avenue, New York 17, N. Y.

"Linde" and "Union Carbide" are registered trade marks of Union Carbide Corporation.



Operation: Blast Cleaning

(ONE OF A SERIES)

Six of seven 32 cu. ft. Rotoblast cleaning barrels stand in line at a large, midwestern automotive foundry. Only two men are needed to operate all six. (Tote boxes in foreground automatically receive cleaned castings.)

BIG JOB, BIGGER RESULTS WITH ROTOBLAST

Day in, day out seven heavy duty Rotoblasts work hard at cleaning the tremendous volume of castings produced at a large, famous automotive foundry in the Midwest. At last count, each of the seven barrels had accumulated more than 600 hours of actual blast time with practically no need for maintenance or repairs.

Proof of the almost completely automatic operation of these machines is that just two men operate a line of six! (The seventh has a separate location for materials handling convenience.)

Whether your cleaning needs are big or small, Rotoblast has a standard unit for the job or can provide specially designed equipment. Labor-saving automation can be built into a single, small unit just as easily as into seven big ones.

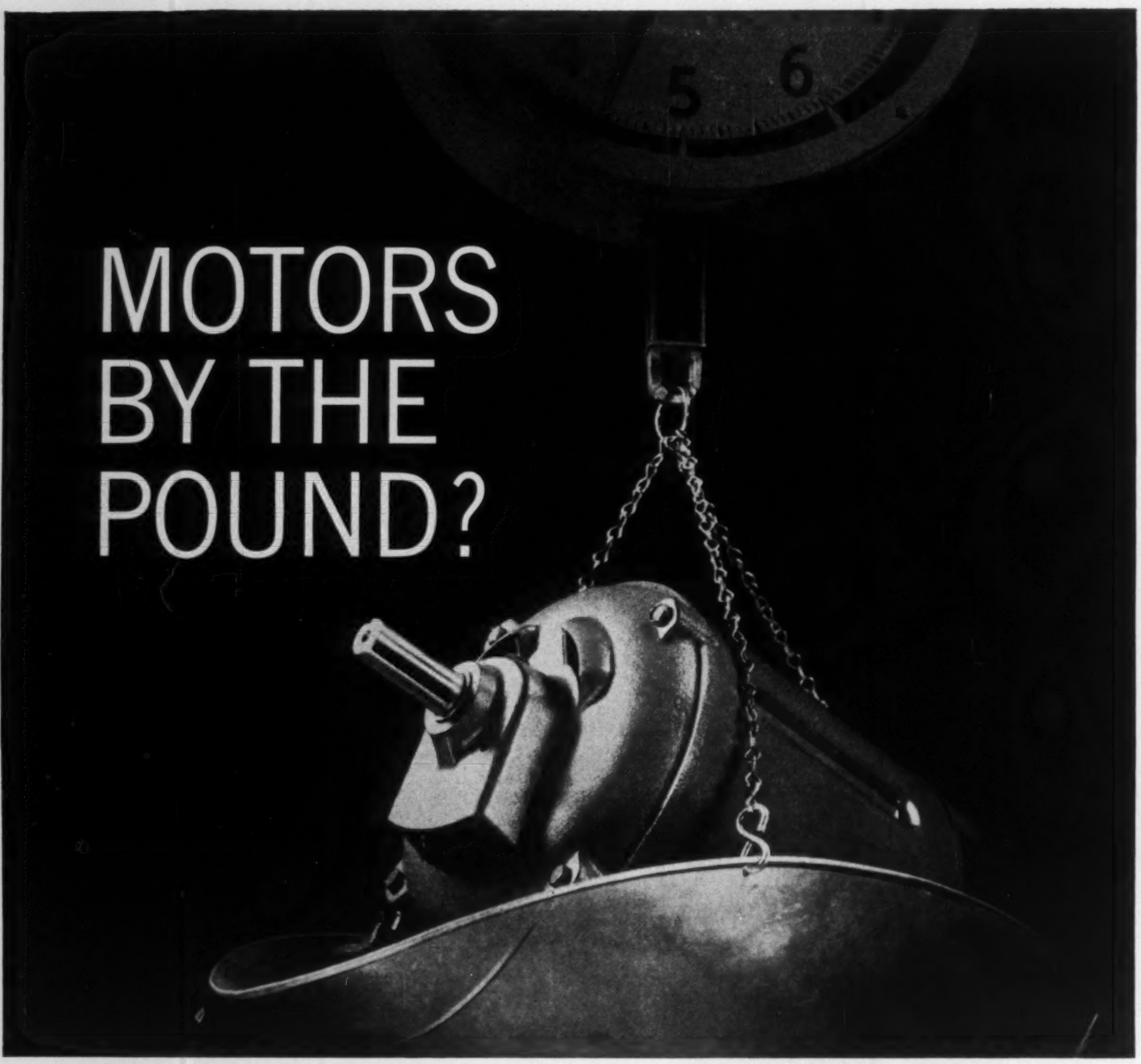
We'll be glad to go into more detail. Just write: PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning, Vibratory Finishing, Dust Control Equipment—Rotoblast® Steel Shot and Grit®.*

Try Rotoblast abrasives, too!

A special, heat-treating process makes Rotoblast Steel Shot and Grit solid, tough, able to take more punishment than ordinary abrasives. Because they are *extra* tough, Rotoblast abrasives last longer, work harder and lower your replenishing costs.

Pangborn

OF HAGERSTOWN



You're buying motors by the pound when price is the only consideration

Sure, you can get a motor for the lowest price, a motor of the same type and with the same rating and operating characteristics of the highest priced motor. But, while initial price is an important factor, the actual cost is the ultimate cost of a motor. And, ultimate cost includes the repair bills, lost production, lost man hours and lost customers that an inferior, built-down-to-a-price motor could cost you.

Wagner® protected polyphase motors do cut expensive downtime. Their cast iron frames can't be affected by corrosive acids, salts, or alkalies. They are designed for cool running . . . stator temperatures stay low to increase motor life. Wagner polyphase motors are designed to permit relubrication that adds years to motor life under severe operating conditions. Wagner motors have earned a reputation for proven dependability.

Next time you buy motors, check beyond the purchase price. Make sure that you get all the performance you need—with motors that will do the job.

Wagner motors have been getting the job done for more than 65 years. Your Wagner Sales Engineer will be glad to show you why. Call him for an analysis of your next motor application, be it for plant or product.

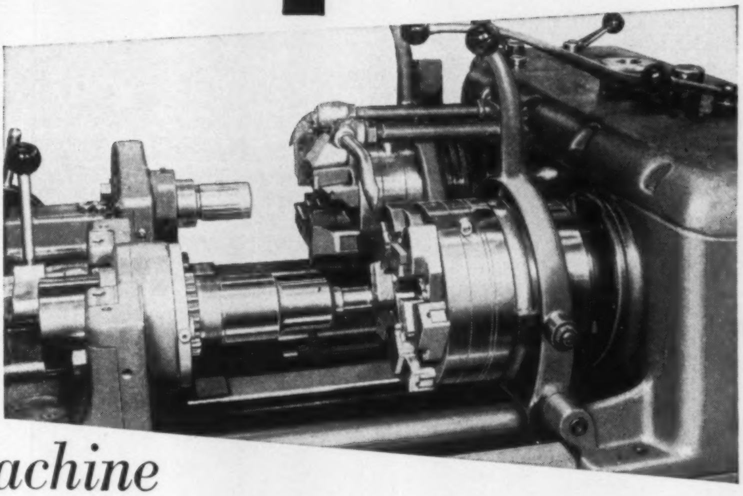
Branches and Distributors in all Principal Cities

Wagner Electric Corporation

6403 PLYMOUTH AVENUE, ST. LOUIS 33, MISSOURI

WH61-3

¾"-4.320" THREADING RANGE

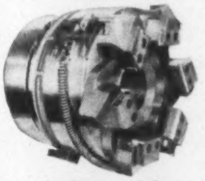


with one LANDMACO machine

The Twin Disc Clutch Company Hydraulic Division in Rockford, Illinois, is able to thread a wide variety of work from ¾"-32 pitch to 4.320"-12 pitch with just one LANDMACO Threading Machine.

A six-chaser 40RX LANCO Head with a range of 2½" to 9¼" (5⅛" bore) is mounted on the right-hand spindle to produce fine-pitch large-diameter threads. A 2½" R LANCO Head with a range of ½" to 2½" is used on the other spindle to produce coarse-pitch threads, small-diameter threads, and long thread lengths.

One of the many different operations performed by this equipment is illustrated-- threading clutch output shafts with the 40 RX Head. The workpiece is made from C1045 steel, heat-treated to 229-269 Brinnell hardness. A special 12-pitch UN Thread, with a 3.669"-3.676" pitch-diameter tolerance, is cut .830" long to within ¼" of the shoulder. 15 pieces are threaded per hour, including 100% inspection by gauging on the machine. Even with heat-treated material and exacting thread finish requirements, 100 pieces are completed between chaser grinds.



Special workholding fixtures (which may be used interchangeably with standard vises) are a major factor in the versatility of this equipment at Twin Disc. In the operation illustrated a special carriage front allows threading a workpiece with a diameter well beyond the normal range of the machine.

Ask for Bulletin F-80 or F-90 (Die Heads)—H-76 (LANDMACO Machines).

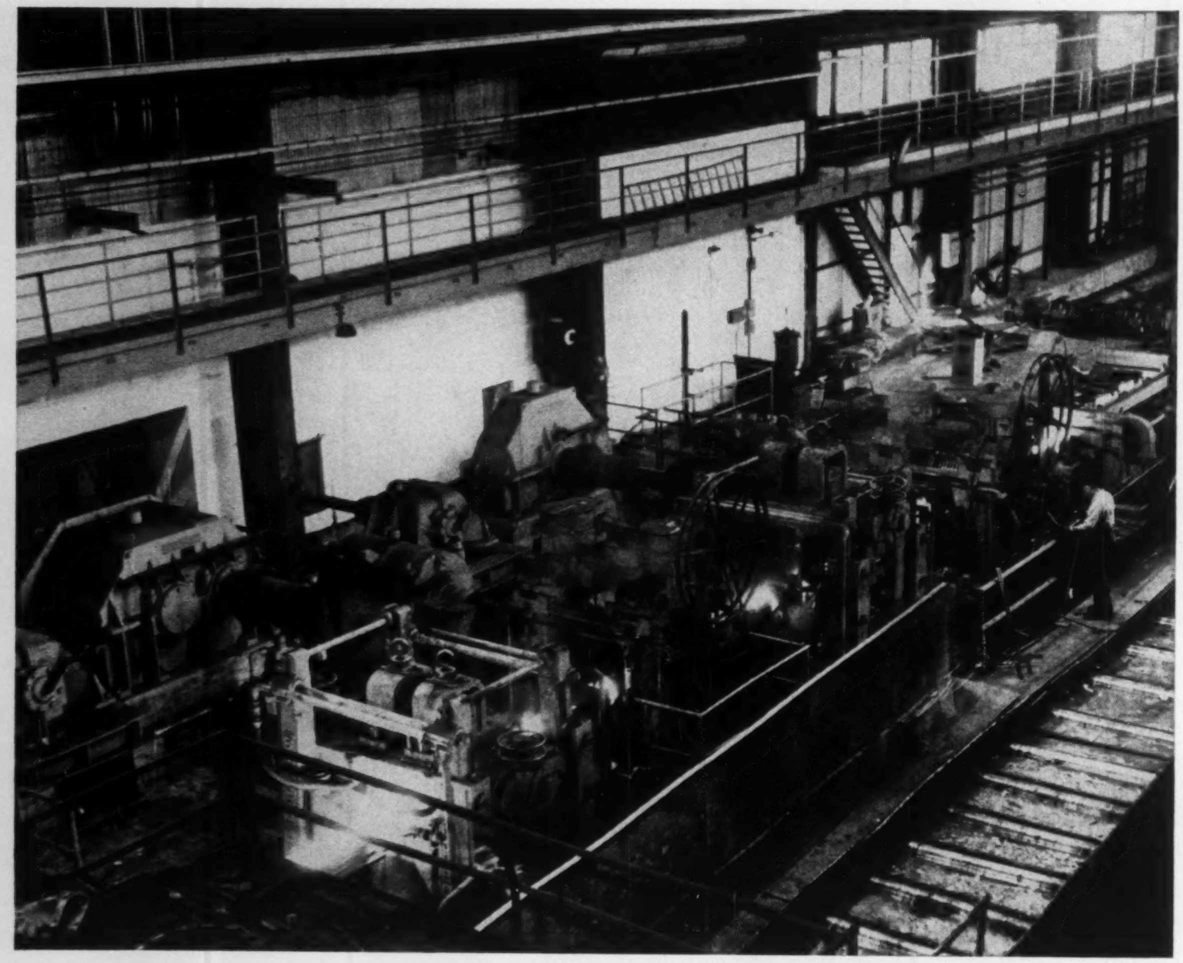
456

LANDIS *Machine* COMPANY

WAYNESBORO
PENNSYLVANIA • U. S. A.

New, faster **BIRDSBORO** 20" Continuous Mill produces up to 100 tons per hour

This 20" Continuous Mill engineered and built by Birdsboro for Aristoloy Steel Division of Copperweld Steel has two vertical and two horizontal roll stands. The use of vertical and horizontal stands permits the mill to roll rounds, squares and flats without twist guides. The use of bevel gear angle drives for the vertical stands permits placing all the main mill motors on the same level in the motor room. Copperweld has successfully rolled 5-inch squares, although design capacity is 2½" to 4¾" squares. The mill is designed to take blooms rolled direct from the ingot by the breakdown mill without reheating. Even high chrome nickel grades of steel that normally require reheating after reduction to 5- to 7-inch squares can be reduced direct to the smallest billet sizes without reheat. The installation of this Birdsboro mill with its many design extras has helped give Copperweld new flexibility of production while reducing costs. Birdsboro custom engineering can solve your production problems and open new profit doors for your mill operations. *Sales Department, Engineering Department and Mfg. Plant:* Birdsboro, Pennsylvania; *District Office:* Pittsburgh, Pennsylvania.

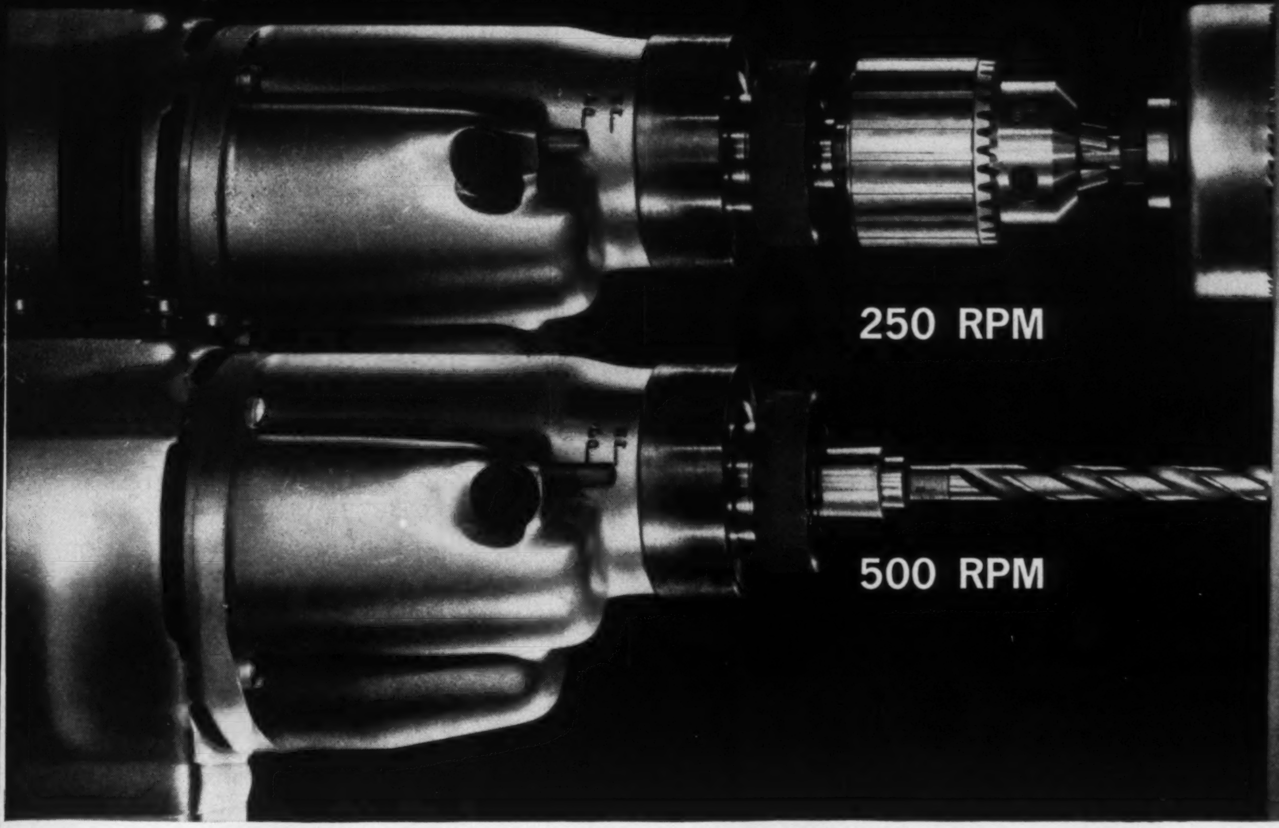


MM79-59

BIRDSBORO

CORPORATION BIRDSBORO, PENNA.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • ROLLS • ELECTRIC STEEL CASTINGS: Carbon, Low Alloy and STAINLESS STEEL



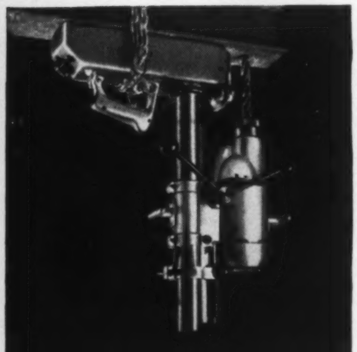
NEW 2-Speed drill has the versatility to do more jobs more efficiently!

Hole sawing . . . masonry work . . . core drilling . . . reaming . . . *any* production drilling job is a cinch with B&D's new precision-balanced Two-Speed Drill. Celebrated B&D engineering even allows you to use this ruggedly built tool as a *separate* power unit. Switch the clutch control and it automatically changes from 500 RPM for high-speed work to 250 RPM for extra-power drilling. Reverses easily too!

You'll appreciate the way B&D reserve power flows out over the heavy-duty roller bearings to give you the *precise* speed for effortless production work . . . the way work speeds through your shop, dramatically reducing your labor and down-time costs. See how B&D's Two-Speed Drill can do your jobs faster, with *less* fatigue . . . with *more* profit! Sold by leading distributors everywhere. *For sales or service look in the Yellow Pages under* TOOLS ELECTRIC

Black & Decker®

CUTS MAN-HOURS TO MINUTES



NEW Two-Speed Black & Decker Magnetic Drill Press

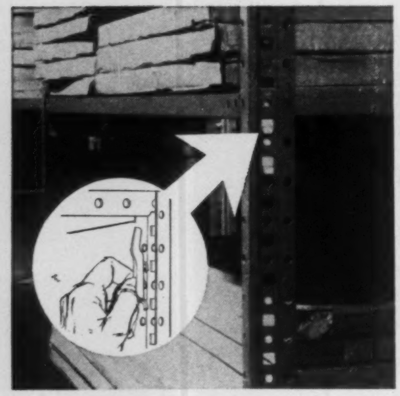
equipped with the new 1¼″ Two-Speed unit operates manually or by exclusive remote control. Work against the ceiling, right side up, or sideways. Gets into tight spots easily, rapidly. Also ¾″ (single speed) model.

The Black & Decker Mfg. Co., Dept. 0902
Towson 4, Md. (In Canada: Brockville, Ont.)

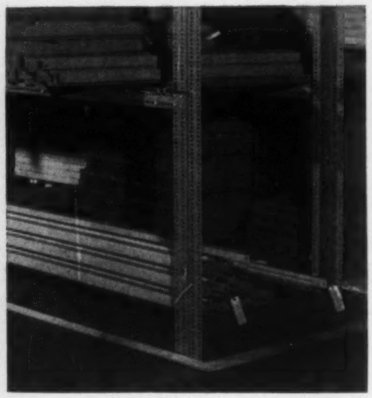
☐ Please arrange for a demonstration of..............
☐ Please send me more information on..............
Name.............................Title..............
Company..............................
Address..............................
City.....................Zone....State..........

☐ IMPACT WRENCHES ☐ HAMMERS ☐ SANDERS ☐ SAWS

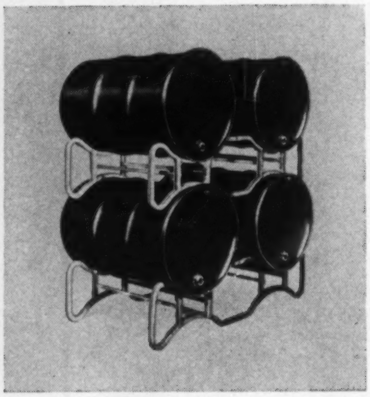
PROPERTY OF
FLEXIBLE
STEEL LACING



REPUBLIC CLIP SHELVING saves valuable floor space. Complete line, including shelves, parts, accessories, and related items. Every piece Bonderized. Erects fast, easy. No tools required. Adjustable arrangements meet changing shelving needs. The shelf snaps firmly into place. Let your Republic representative storage-engineer your shelving problems. Call, or send coupon today.



REPUBLIC METAL LUMBER provides faster, stronger, safer framing in any application where common building materials are now being used. Simply measure, cut, assemble. Engineered slotted angle pattern speeds erection, reduces time and material costs. Bonderized. Available in two gages, two widths, in standard bundles of 10- or 12-foot lengths. Call or write for attractive brochure.



REPUBLIC PORTABLE DRUM RACK . . . newest idea for storing 55-gallon drums. Strong and sturdy. Six-piece bolted construction. Assembles quickly and easily. Demountable for shipping. Designed for easy stacking and storing. Weighs only 39½ pounds. All-steel channel construction. Saves valuable floor space. Available for immediate delivery. Send coupon for more information.

RACK, STACK and PACK

Republic Standard Hopper End Boxes

They do it at Flexible Steel Lacing Co.

This manufacturer of belt fasteners for conveyor belting, racks and tilts standard Republic Hopper Boxes at a 45° angle along assembly counters. Parts slide down onto counters as needed.

Now, boxes packed with parts stack four and five high, saving floor space and eliminating clutter prevalent when former wooden boxes on casters were used.

This modern, efficient, small parts handling system is another example of how Republic Material Handling Specialists can adapt economical standard boxes to solve particular problems. This ingenious, money-saving system was engineered by Thornel Associates, Republic's Chicago material handling specialists.

Republic's big line of standard units can provide the basis for the system you need to speed operations, save space, time and money. Call your Republic representative or return coupon below.

Flexible Steel Lacing Company speeded assembly operations and took the stoop out of the job with Republic Corrugated Boxes. Special tilting racks behind work counters were designed to hold boxes at an angle so that parts fall onto the table as needed. Easy to stack and store, Republic Boxes save valuable floor space, too.

Strong, Modern, Dependable

REPUBLIC STEEL

World's Widest Range
of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. IA -1679
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

Please send more information on the following products:

- ☐ Republic Material Handling Units
- ☐ METAL LUMBER®
- ☐ Please have a Republic material handling specialist call
- ☐ Clip Shelving
- ☐ Hopper Boxes
- ☐ Drum Racks

Name__________ Title__________

Firm__________

Address__________

City__________ Zone_____ State_____

OHIO *WELDED TUBING*

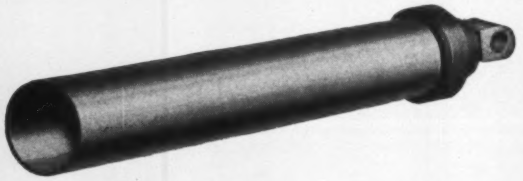
CORNERSTONE-LAYING WITH NO CEREMONY

In today's hustling, bustling construction business there's no time to stand on ceremony . . . no point in risking costly equipment failure.

To short-circuit mechanical downtime, leading construction equipment producers specify Ohio Tubing for power cylinders and fluid lines, mechanical and structural members. This gives equipment the heft and brawn to shrug off brutal, grinding punishment . . . gives equipment users a high degree of protection against disastrous delays.

You can strengthen your product — and its mechanical reputation — by specifying Ohio *Custom Made* Tubing. The name Ohio is the hallmark of the highest quality in tubing, both seamless and welded. And we're now able to deliver a broader range of welded tubing sizes, wall thicknesses and grades than ever before.

Let's not stand on ceremony. We want your tubing business — seamless to 7″ OD, *welded up to 7½″ OD*. For a fast start, contact your nearest Ohio representative, or send part drawings to the plant at *Shelby, Ohio—Birthplace of the Seamless Steel Tube Industry In America.*



Ohio Seamless offers the broadest parallel range of both welded and seamless quality steel tubing in the industry.

OHIO **OHIO SEAMLESS TUBE**

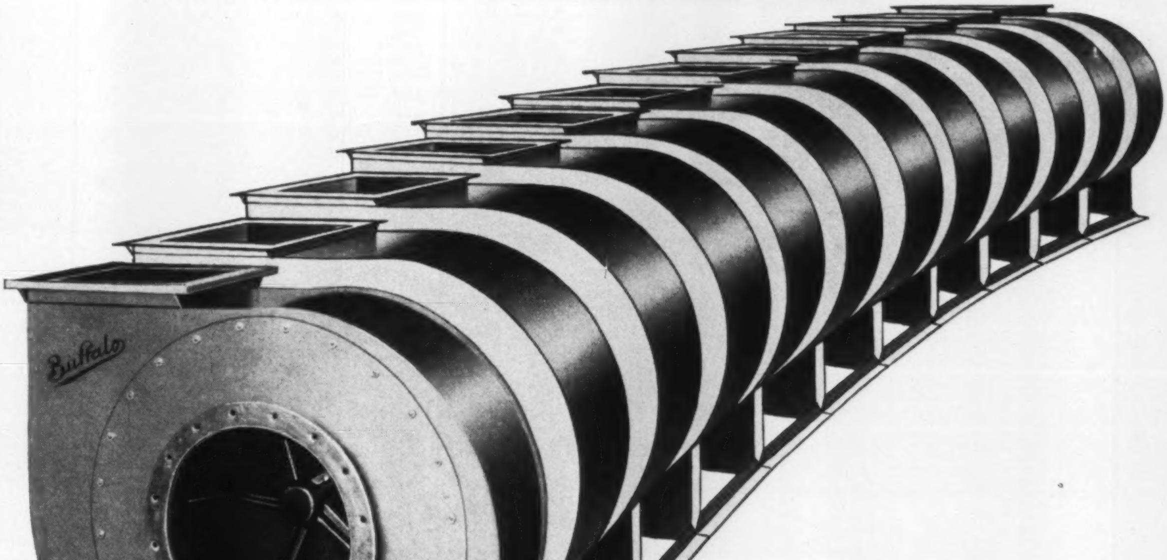
Division of Copperweld Steel Company • **SHELBY, OHIO**

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

Representatives in principal cities. Check leading directories: THOMAS', MacRAE'S, CONOVER-MAST, SWEET'S, FRASER'S.

A-3305A

ON CORROSIVE JOBS



EXTEND FAN LIFE 3 TO 12 TIMES

By "welding" rubber to all metal parts of a fume fan, Buffalo Forge extends fan life 3 to 12 times. Certainly, where you handle highly corrosive fumes, there is no more economical way than with these 'Buffalo' rubber-lined fans. The extra cost for the lining is repaid many times in longer service without downtime losses for replacement.

Other Corrosive Applications may not require rubber-lined fans. Special coatings, stainless steels and other materials are often adequate for the fumes exhausted. For example, 'Buffalo' builds resin-bonded fiber glass fans which are both corrosion and impact resistant to temperatures up to 225° F.

For Every Condition, you can depend upon Buffalo Forge for effective, efficient and economical answers to your air handling problems.

Write today for Bulletins 2424-F and FI-511, outlining the chemical characteristics, volume and pressures of fumes to be exhausted — or call your nearby 'Buffalo' Engineering Representative.

AIR HANDLING DIVISION
BUFFALO FORGE COMPANY
Buffalo, New York
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.

FINGER-TIP CONTROL

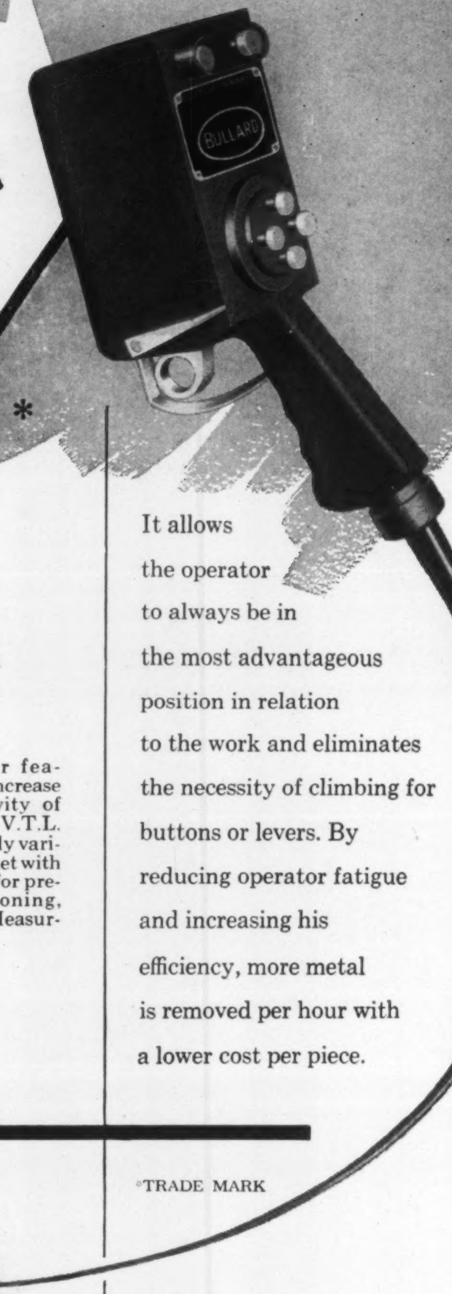
Increases Productivity of...

BULLARD

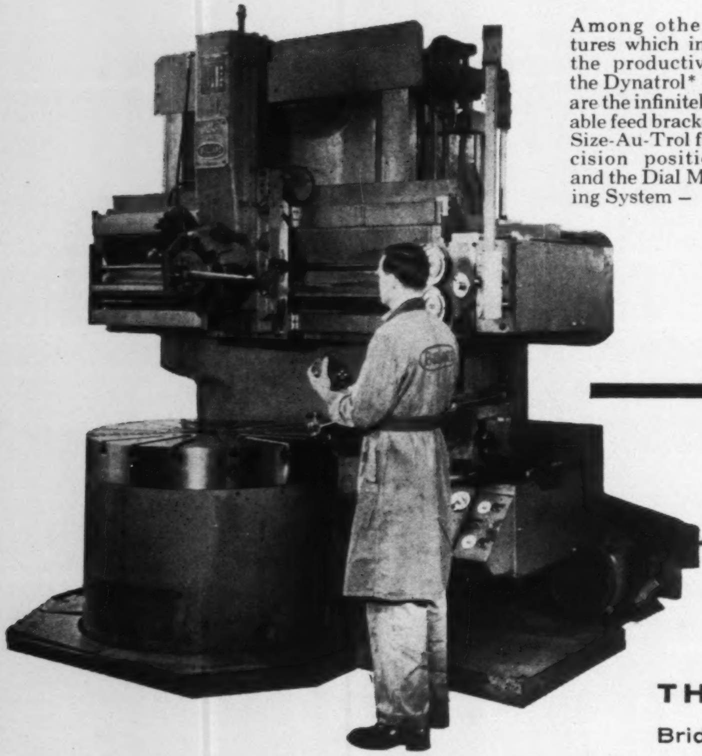
DYNATROL*

VERTICAL TURRET LATHES

Directional control of all head motions in feed on traverse, either horizontally, vertically or at any 45° angle, as well as table start and stop from a lightweight portable pendant, is a distinct production advantage.



It allows the operator to always be in the most advantageous position in relation to the work and eliminates the necessity of climbing for buttons or levers. By reducing operator fatigue and increasing his efficiency, more metal is removed per hour with a lower cost per piece.



Among other features which increase the productivity of the Dynatrol* V.T.L. are the infinitely variable feed bracket with Size-Au-Trol for precision positioning, and the Dial Measuring System –

*TRADE MARK

ask your Bullard Sales Engineer for the complete Dynatrol story or write for catalog.

THE BULLARD COMPANY
Bridgeport 9, Conn., Telephone EDison 6-2511

YOU CAN'T BEAT A BULLARD

SYLVANIA BLAZES NEW TRAILS IN REFRACTORY METALS...
COBALT
TUNGSTEN
NICKEL
5500°F
ZINC

REMARKABLE NEW PROCESS

... opens way for you to solve critical high-temperature design problems

At 5500°F. cobalt runs like water. Nickel boils. Zinc vaporizes. But tungsten remains solid.

To make this property pay off for you, Sylvania recently put to work its new isostatic pressing and sintering operation. Through this operation, it can produce tungsten or molybdenum ingots up to 10" in diameter and up to 4 feet long. *Sylvania now produces all four* — billets and ingots for forging, electrodes for arc casting, blanks for machining, or machined blanks ready for your use.

Perhaps you've never considered refractory metals as the answer to your needs. But the same properties that solve the problems of throat inserts for rockets and missiles can pay you dividends in piercing points, boring bars, dies, tools and in countless other ways.

Want more facts? Or experienced technical help in proving out your special ideas? Just write Chemical & Metallurgical Division, Sylvania Electric Products Inc., Towanda, Pennsylvania.

SYLVANIA

Subsidiary of **GENERAL TELEPHONE & ELECTRONICS**

At Fruehauf Trailers' huge Avon Lake, Ohio, plant, crossmembers made from PITT-TEN high strength structural sheet provide 22 percent more payload.

Here, on the assembly line, a Fruehauf trailer bed made with Pittsburgh Steel Co. PITT-TEN is swung onto the underconstruction assembly.

As Trailer Bed Crossmembers

Fruehauf Gets 22% More Payload With Pittsburgh Steel's New PITT-TEN

Twenty-two percent more payload—that's what Fruehauf is building into the framework of giant trailers assembled with crossmembers made of PITT-TEN, Pittsburgh Steel Company's new high strength structural sheet.

Fruehauf uses PITT-TEN #1 at its Avon Lake, Ohio, plant—the largest trailer manufacturing facility in the world—because it offers a combination of benefits that . . .

- **Cuts deadweight with no loss of strength**
- **Lengthens service life through superior corrosion resistance**

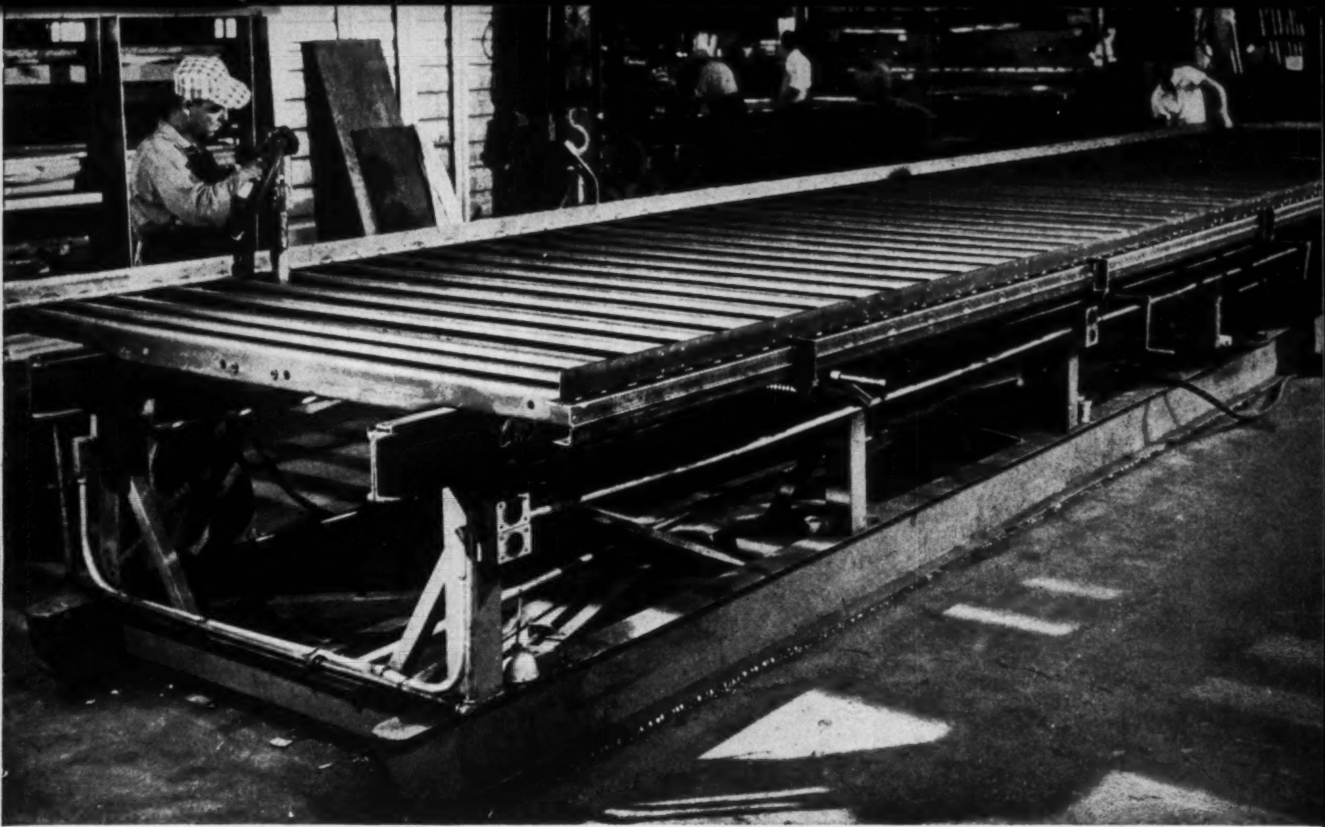
- **Light Yet Strong** — Fruehauf tries to make its trailers as light as possible with no sacrifice in strength. Trailer bed crossmembers made of high strength PITT-TEN are lighter, for equal strength, than mild steel.

The weight saving amounts to more than eight pounds for each piece. That's because three pounds of PITT-TEN do the work of nearly four pounds of ordinary sheet steel. At the same time, it provides all the strength needed for years of hard use.

Corrosion resistance is another problem in trailer operation. Fruehauf trailers are used under all types of conditions that could create maintenance headaches if the proper material were not used.

PITT-TEN #1 has four to six times the resistance of carbon steel to atmospheric corrosion. So, Fruehauf specifies PITT-TEN to reduce maintenance costs.

The trailer part basically is a channel 93⅞ inches long, 2 inches deep and 3 inches wide. Its width is expanded to 4½ inches on one side by an offset that extends most of its length. In addition, a ¾-inch



During assembly of Fruehauf trailer bed, cross-members made from high strength structural PITT-TEN are riveted to the side rail. PITT-TEN #1 reduces maintenance requirements of Fruehauf trailers through superior corrosion resistance. It has four to six times the corrosion resistance of carbon steel to atmospheric corrosion. PITT-TEN also cuts deadweight with no loss in strength.

return flange is applied full length to both edges.

Fruehauf engineers point out that forming this piece with offset and flange in high tensile steel would be a tricky business without consistent quality — and with PITT-TEN Fruehauf has a steel that does the job.

PITTSBURGH STEEL NEW SOURCE—This is one of several applications which mark the entry of Pittsburgh Steel in the high strength steel market, one of the fastest growing in metalworking.

That means this:

Fabricators of high strength steel structurals—or any product where the weight/strength ratio is a factor—now have a new source of supply.

In the eight years Pittsburgh Steel has been producing flat-rolled products, it has become recognized for the unexcelled quality of its steel sheet and strip. Now PITT-TEN is being produced by the same fine steelmaking and steel rolling facilities which have earned that reputation for quality.

PITT-TEN is produced in three grades, each with specific physical properties. Briefly, here they are:

PITT-TEN #1—An all-around high strength structural sheet that offers a combination of benefits. First is greater strength without increased weight; or equal strength with a lighter section. Second is longer product life, less maintenance through greater resistance to corrosion (four to six times that of mild carbon steel.)

PITT-TEN #2—high strength sheet with exceptional formability. This grade is produced to tensile and yield requirements to meet forming problems of specific fabricated parts.

PITT-TEN "X"—produced to guaranteed minimum yield points of 45,000 and 50,000 psi. This grade is especially useful where the controlling factor is a reduction in weight without loss of strength.

If your product's success depends on weight/strength factors, then Pittsburgh Steel's new PITT-TEN can benefit you, too.

Let one of our service metallurgists show you how. They're as familiar with steel fabricating problems as they are with steelmaking problems. Just contact one of the sales offices listed here.

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

DISTRICT SALES OFFICES

Atlanta
Chicago
Cleveland
Dayton
Detroit
Houston
Los Angeles
New York
Philadelphia
Pittsburgh
Tulsa
Warren, Ohio

Steel

MOST
TALKED ABOUT
SHEARS TODAY!

new gap frame series has quietest holddown in the industry!

Fifty percent (50%) faster than ever before and by far the most accurate of all, new Niagara Gap Frame Shears have a quiet operating holddown that's the talk of the industry.

And no wonder. Holddown feet simply never touch the bed. Yet they apply full pressure . . . a powerful toggle-action grip on thick and thin material alike. Simultaneously, in fact. There's *never* any pounding or hammering of the bed. *Naturally,* it's bound to be quieter!

But, because attention is currently focused on the holddown, don't *you* overlook these other equally important features:

- Massive, closed box section bed forms a rigid backbone for the shear and a solid backing for the knife.
- Rigid, closed triangular section crosshead keeps upper knife in perfect alignment without shims or set screws.
- Combined, total rigidity assures utmost accuracy and square cuts.
- Reduced slope of upper knife produces flatter strips with less twist or curl.
- Front controlled 2-speed power back gage provides extra work clearance at rear of machine.
- New mirror-light gage enables shearing wider sheets to a scribed line.

Now for more facts and figures, request Bulletin 860-S. Write today. NIAGARA MACHINE & TOOL WORKS, 683 Northland Ave., Buffalo 11, N. Y.

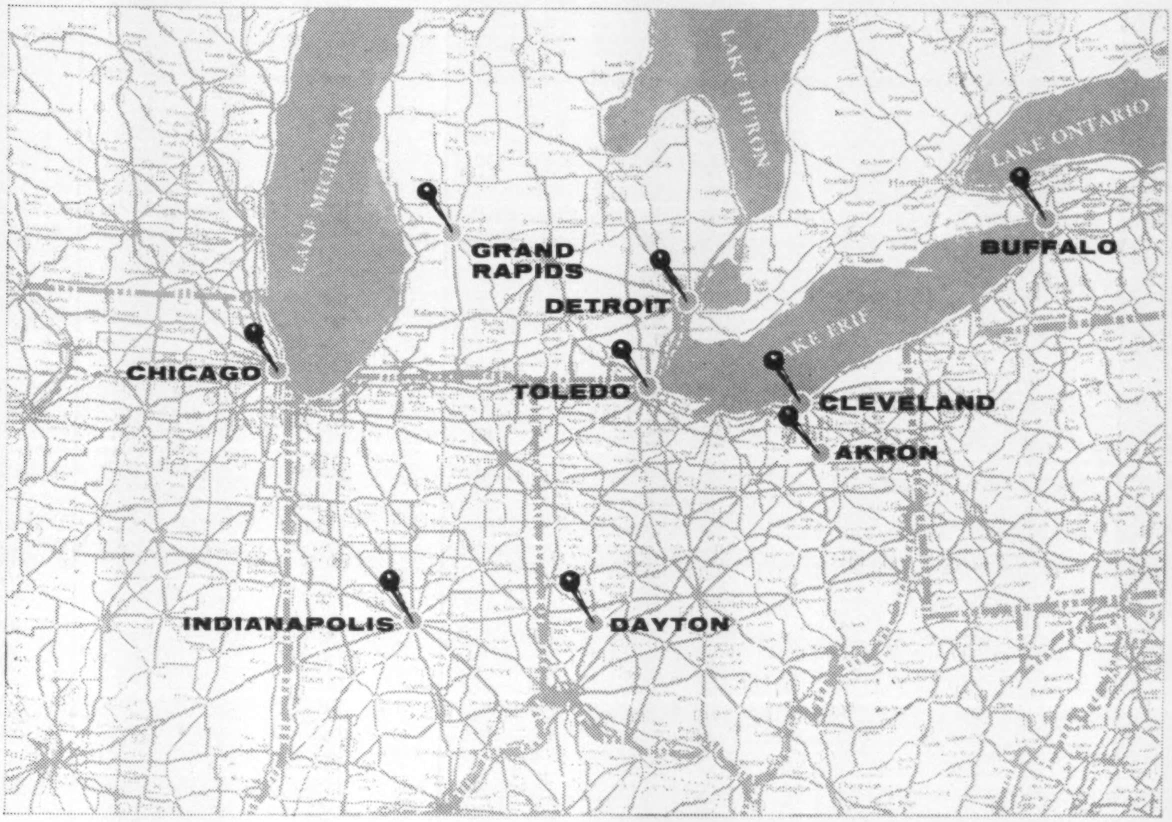
NIAGARA

The Most Extensive Line of Shears in the Industry . . . Overdrive and Underdrive . . . Power and Manual

PENINSULAR'S Team of 9 Steel Service Centers working together to give you

STEEL plus SERVICE

America's Largest Independent Tool Steel Distributor


LAKE MICHIGAN
LAKE HURON
LAKE ONTARIO
LAKE ERIE
GRAND RAPIDS
BUFFALO
DETROIT
CHICAGO
TOLEDO
CLEVELAND
AKRON
INDIANAPOLIS
DAYTON

TOOL STEELS • ALLOYS • COLD DRAWN • HOLLOBAR

PRECISION GROUND STEELS • DRILL ROD • PLATE

Over 40 Years of Service to Industry

PENINSULAR STEEL COMPANY

24401 GROESBECK • P. O. BOX 3853 • DETROIT 5, MICHIGAN
DREXEL 1-9400 • PRESCOTT 8-2121

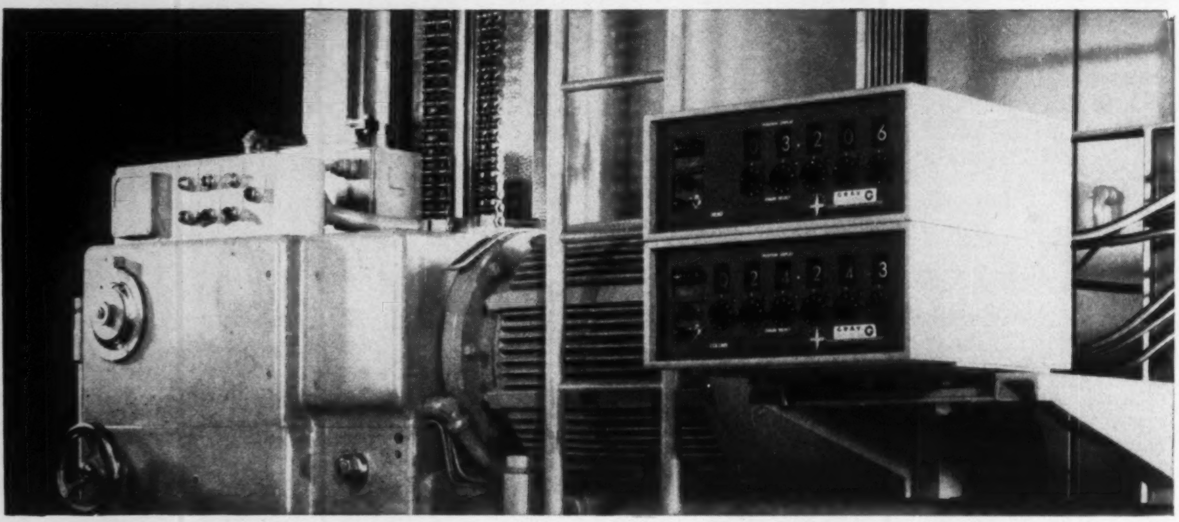
STEEL SERVICE CENTER INSTITUTE

DETROIT • CLEVELAND • INDIANAPOLIS • TOLEDO • AKRON • DAYTON • CHICAGO • GRAND RAPIDS • BUFFALO

NORDEN Modumatic Control for New and Existing Machines

Series 100 features

- ☆ Actual Position Readout
- ☆ Decimal Display
- ☆ Full Range Origin Select



IF you have the time-consuming problem of rotary or linear positioning, then you are aware of the importance of knowing the exact location of the tool or the work piece. Up until now this was a tedious, time-consuming process requiring calculation and dial reading, both subject to human error. Norden's Series 100 display system eliminates all this and performs the calculations automatically. What's more, it can be installed on **new** and **existing** machines.

The Series 100 numerical control system utilizes a unique position feedback transducer, electronic circuitry and a visual display to indicate the **actual** position of the tool or work piece.

The **actual** position is displayed in straight decimal form by illuminated numbers that are readable from twenty feet. The display unit may be located on the machine or remote.

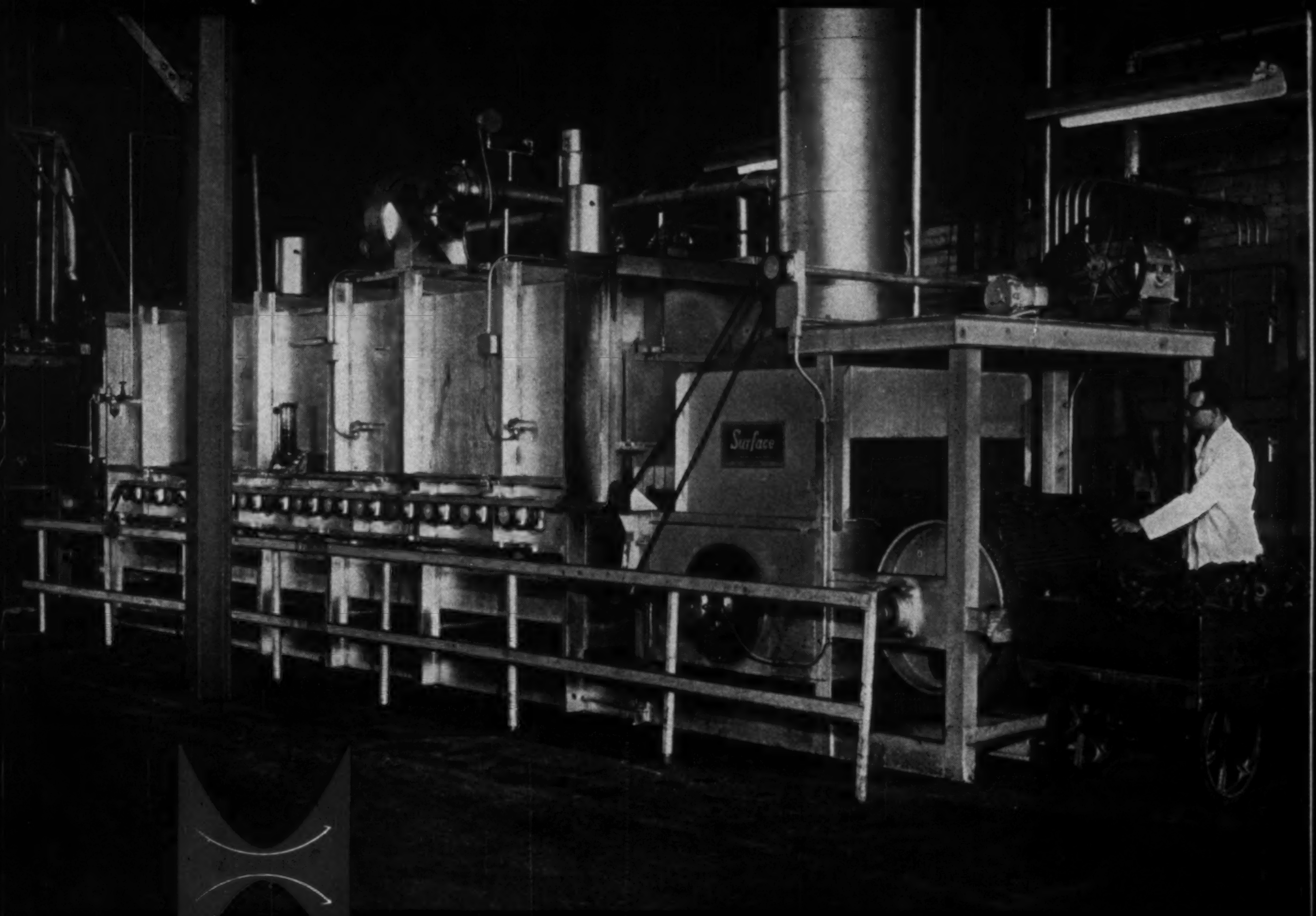
This Norden Modumatic system also offers a full range electronic origin select so that any desired offset can be quickly and easily dialed in by the operator on manual selector switches.

For more information about this position display system or other Modumatic control systems contact your nearest Norden Representative—400 Main Street, East Hartford, Connecticut, JAckson 8-4811, 11 West Monument Ave., Dayton 2, Ohio, BAldwin 8-4481, or write to us at the address below.

A new concept in Numerical Control

from ☆ **NORDEN** ☆ **DIVISION OF UNITED AIRCRAFT CORPORATION**

DATA SYSTEMS DEPARTMENT
COSTA MESA, CALIFORNIA



SURFACE POWER CONVECTION EQUIPMENT

cuts Ross Gear forging process time 50%

High speed, high volume air circulation is the feature of this Surface continuous draw furnace, which enabled Ross Gear and Tool Company, Lafayette, Indiana, to

(1) process a wide variety of steering gear forgings much faster than with the batch type furnaces replaced. These forgings range from a few ounces to 22 pounds.

(2) draw forgings at rates to keep up with production in hardening operations.

(3) reduce handling operations, consequently reassign personnel to more productive jobs.

The furnace has three separately controlled zones, each with its own burners and fan. The uniformity of furnace temperature from zone to zone is consistently held within ±5°F.

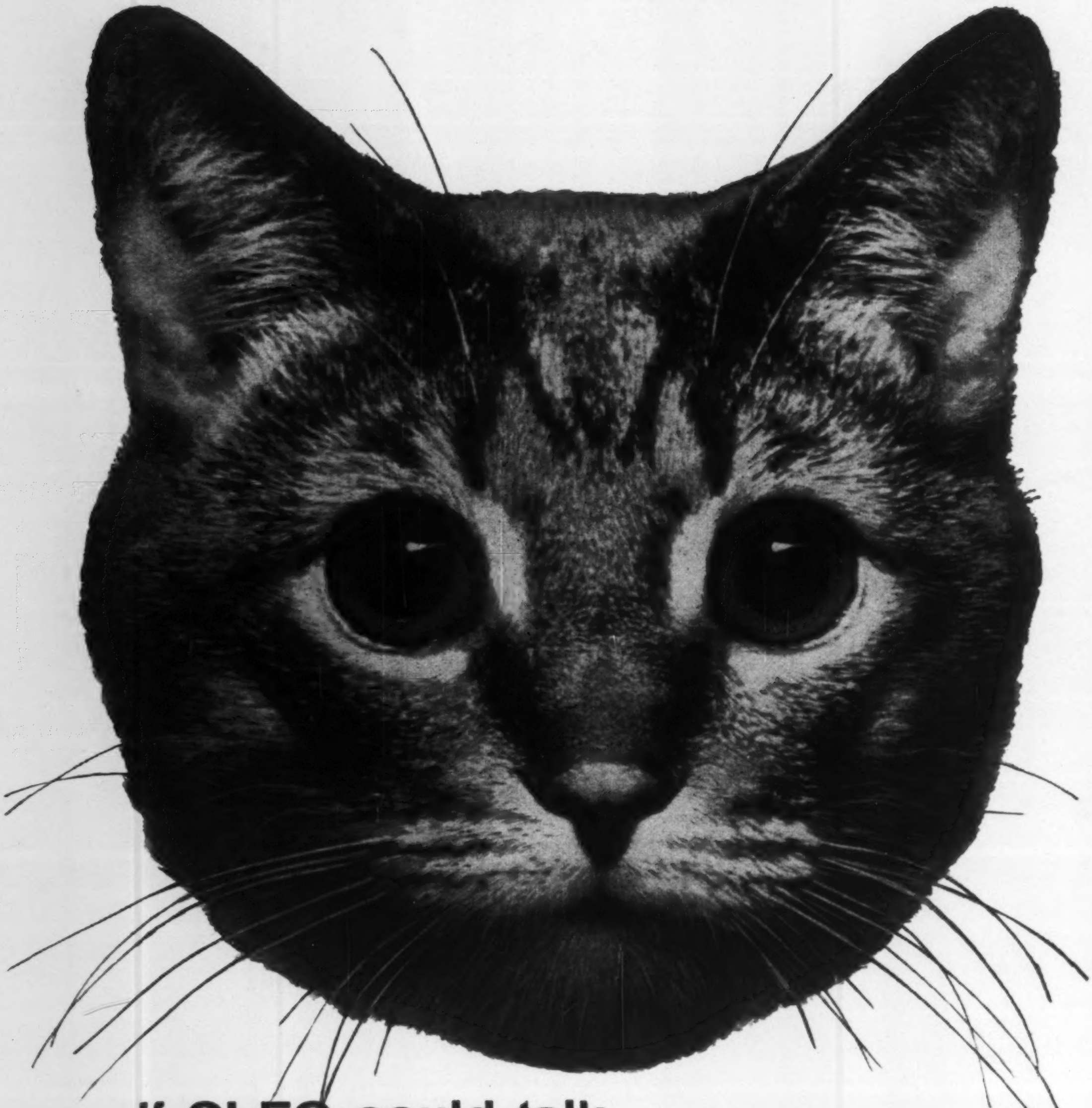
Mr. Leonard Ewalt, Chief Metallurgist of Ross Gear, reports: "The furnace will heat through a 2-inch section in approximately 40 minutes—just about as fast as the metal can take it when heated by convection . . . I would say that with this method of distributing heat in the zones and the rapid heating rate, this Power Convection furnace* is a couple of years ahead of its time.

We're not waiting for tomorrow, either. We're getting results today."

Write for bulletin SC-182. Surface Combustion, 2373 Dorr Street, Toledo 1, Ohio. In Canada: Surface Industrial Furnaces Ltd., Toronto, Ont.

*Trademark of Surface Combustion, Division of Midland-Ross Corp.

Surface *A division of Midland-Ross Corporation* MR



if CLEO could talk . . .

This is Cleo, a cat who makes her home near the secure warmth of our billet furnace.

Cleo is an eye witness to almost every operation in our plant. Day and night, she sees the relentless effort of our "men of steel" to produce steel of quality . . . men who are qualified not only by years of experience in the production of high quality steel for cold heading and nut formations, but also by a keen CONSISTENT interest to maintain quality . . . and to give every order, regardless of quantity, the *same* special attention.

There are a number of sources for bars and rods, but if CLEO could talk to YOU . . . you'd call Seaway next time you order!

Ask us about a delivery date on your next order! ☎ NX 3-9700

SEAWAY STEEL CORPORATION

101 EAST AVENUE • NORTH TONAWANDA, NEW YORK

MARKET-PLANNING DIGEST

STEEL SERVICE CENTER MEN ARE TOLD they "must increase their capital investment to maintain their competitive position in the years ahead." According to F. B. Rackley, Jessop Steel Co. president, this investment should be to enlarge inventories and increase processing range. Jessop disclosed sales of its warehouse division jumped 12 pct in 1960 as a result of such investment.

ALUMINUM CANS AIM FOR WIDER MARKET. Already booked for an estimated 60 pct of Florida's six-ounce frozen juice production, aluminum cans are expected to make their next major advance in seafoods. Reynolds Metal Co. expects the tuna fish industry to convert to aluminum in 1962 for the half-pound size. About 600,000 half-pound tuna cans are packed annually. But steel mills are countering with thin tinplate and discount many aluminum claims.

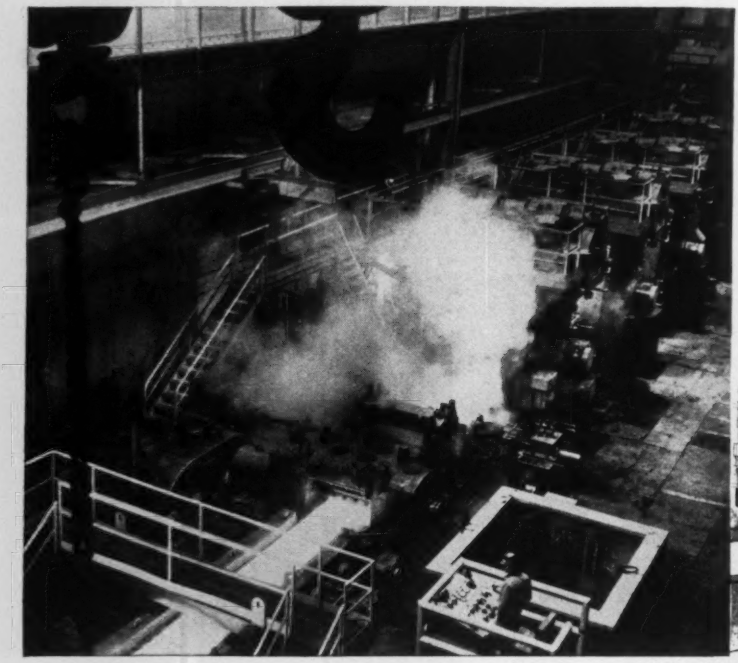
GOODS ON THE MOVE show a slowdown. For the week ending January 14, loading of revenue railroad freight totaled 516,210 cars. This is down 14.8 pct below the corresponding week in 1960. And intercity truck tonnage for the same period was down 8.2 pct compared to 1960. These drops continue a downward trend.

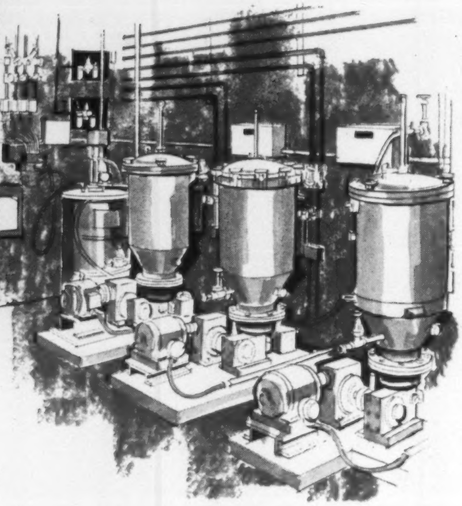
A RIPE MARKET FOR MANY U.S. GOODS is East Africa's 22 million people. A six-man U.S. trade mission recently returned from that area and reports this is an "untapped market." What's more important: They would welcome U.S. merchandise. P. 13

FURTHER INVENTORY DECLINES were noted by the nation's buyers in a January survey of the National Assn. of Purchasing Agents. But the decline, say the buyers, was at a slower rate than for the previous month. The buyers report prices generally steady with pressures that appear to be "slightly upward."

A GOOD SIGN FOR CAPITAL SPENDING this year is that the average company is "well fortified financially" due largely to the heavy cash flow stemming from rising charges for depreciation. This is the view of financial analysts of Standard & Poor's Corp. But the experts point out that capital spending programs are stressing labor-saving equipment, not plant additions.

STAINLESS STEEL OUTPUT for 1960 totaled 1,003,637 net tons, according to preliminary AISI data. This is down slightly from the 1.1 million tons made in 1959. It is the sixth year in which stainless output exceeded the one million ton level.





- Typical large, automatic motor-driven pumping station set-up for heavy-duty service on a hot strip mill centralized lubrication system.

Positive Farval centralized lubrication protects 1597 bearings on Jones & Laughlin's hot strip mill

On this semi-automatic, punch card controlled, high-production (*rolls over 100,000 tons monthly*) 44-inch Hot Strip Mill—first of its type in the world—26 Farval centralized lubricating systems work 'round-the-clock to protect 1597 vital bearings—help keep this up-to-the-minute rolling facility in continuous 24-hour production, cut operating costs.

Rolling mill operators the world over have found through experience that Farval:

- Saves time—lubricates all bearings in a few minutes, while mill equipment remains in full operation.
- Saves power—by reducing friction, Farval cuts power consumption by as much as 20%.
- Saves bearings—bearing life increases 5 to 25 times when Farval serves the equipment.
- Saves lubricant—much as 3 out of every 4 pounds.

Farval can be relied upon to provide the right amount of lubrication—when it's needed, where it's needed. In addition Farval provides indication and adjustment at every bearing, system time cycle flexibility, and handles the widest range of lubricants. Many bearings can easily be lubricated over a large area from one conveniently located central station.

Remember, for the ultimate in bearing protection on all types of industrial production machines and equipment—Farval is the cost-cutting answer. Get the latest information on how Farval can fit into your production picture—it's in free Bulletin 26-T. Write us for your personal copy, today.

FARVAL®

CENTRALIZED SYSTEMS OF LUBRICATION

Farval Studies in Centralized Lubrication No. 252

Farval Division • Eaton Manufacturing Company
3282 East 80th Street • Cleveland 4, Ohio

EATON®

THE UMPIRE: Arbitration experts like James C. Hill (left) often go to the source of the grievance.

Arbitration Costs Are Climbing, But Are They Excessive?

Every year labor arbitrators are handling more and more union-management disputes.

Costs are climbing, but when you consider the alternatives, it still looks like a bargain.

By H. R. Neal and
K. W. Bennett

▪ Labor arbitration specialists expect a record number of cases in 1961. Inevitably, this means greater arbitration costs—if for no other reason than it will require more man-days for arbitrators.

Morris Stone, editorial director for the American Arbitration Assn., says, "Our experience has been that as business conditions change, grievances multiply. And the increase is always greatest when there is a recession. We expect the unbroken line of increase, averaging 15 pct per year over the past six years, will continue in 1961."

Reasons For Climb—The predicted increase in labor grievances going to arbitration this year is backed up by George E. Strong, general counsel for the Federal Mediation and Conciliation Service.

Explains Mr. Strong: "There is greater competition between plants even of the same company for the limited amount of business available. There is also intensified competition within each plant for overtime. There are fewer jobs and work opportunities. Long dormant contract rights such as seniority and transfer becoming meaningful."

He then points out that, "To a greater extent than in more prosperous times, industry and labor are obliged to rely on arbitration to solve problems and disputes which reduce the pressures with a minimum loss in production and income."

Historic Pattern—Labor arbitration became a fixed feature of labor contracts during WW II. It was made compulsory in many instances by the War Labor Board. At the end of the war, about 80 pct of labor contracts provided for arbitration.

Since 1945, there has been no compulsion. Despite this fact, arbitration clauses increased to nearly 90 pct by 1950. They are now estimated to be around 95 pct. General counsel Strong says his service had a 13 pct increase in requests for arbitrators in the last half of 1960 as compared with the same 1959 period.

And the increase was even more dramatic in the last two months of the year over the same months of the previous year. November showed a 23 pct increase, December a 22 pct increase.

Arbitrators Busy—And, he con-

Eight Ways to Trim Arbitration Costs

Know Your Arbitrator. Find out as much as possible about him in advance—familiarity with your industry and whether he has arbitrated a dispute similar to yours; how much he charges.

Stipulate Facts in Advance. Parties should get together before the hearing starts and stipulate facts that aren't in dispute. It saves both the arbitrator's hearing room and reading time.

Avoid Futile Fights About Arbitrability. If you are convinced a case isn't arbitrable, make an issue of it at the hearing. But if it matter of doubtful merit, argue it on the basis of merit.

Avoid Indiscriminate Citations. Unless he's a permanent umpire, the arbitrator generally doesn't have to follow precedent. Pointless or inaccurate citations make him "go to the books," boosting study time.

Limit Hearings Transcript Orders. If really needed, get them. But court reporting is expensive. Transcripts delay the award because the arbitrator can't write an opinion until he gets the record.

Written Opinions Aren't Always Needed. Most of the time, they are worth their cost. They provide guides in the future. But some cases are "political." An award without an opinion will do.

Consider Arbitrator's Time. Keep hearing dates and avoid postponements unless they are absolutely necessary. The arbitrator's time is valuable. He may charge for a last-minute cancellation.

Check Hidden Costs. If the case involves continuing liability, such as back pay for discharged workers, delays in arbitration can run up heavy costs as the "back pay meter" continues to run.

---

tinues, requests to FMCS for suggested names of arbitrators has increased from 1240 in 1955 to 2835 for the last fiscal year. This is more than a 125 pct increase over the past five years.

AAA handled 3231 cases last year. It expects to handle between 3700 and 3800 cases this year. As recently as 1955, arbitrators registered with the association handled only 2025 cases.

No one knows just how many grievances actually go to arbitration each year. Estimates range from 20,000 to 30,000 per year—and these are admitted guesses. The difficulty arises from the fact that only a few groups maintain figures on cases handled—and then only those in which their members or arbitrators participated.

On the Record—American Arbitration's figures are more complete than most—but only for the cases in which it has a part. This independent arbitration service processes requests for service and follows them through to the end—whether settled by the arbitrator or before he actually conducts a hearing, the nature of the grievance, and which party won.

FMCS, a service of the Labor Dept., provides panels of arbitrators when requested—generally 7 names from the 700 registered with the service. It records only the number of requests and doesn't follow up to see how many cases actually go through arbitration.

Know the Arbitrator—But in the majority of cases, labor and management call directly on an arbitrator known to them. Or panels are provided by industry associations or similar groups. None of these files reports centrally.

Points of Difference—According to AAA's Mr. Stone, the most frequent issues, as in past years, were discipline and discharge. The 615 cases accounted for nearly 27 pct of the total. But he notes the frequency usually fluctuates with economic circumstances.

Next in importance: "Reflecting labor and management preoccupation with technological developments and economic disorders, job evalution and other technical disputes rose to second place with 507 cases, representing 22 pct."

Seniority disputes, with 386 cases, took third place and 17 pct. Most of these cases were concerned with layoff problems. In some previous years, he says, distribution of overtime accounted for a significant proportion of the disputes. It was still in fourth place last year, but incidence of grievances fell to about 1.5 pct of the total.

All other grievances accounted for the remaining 29 pct. And no single classification accounted for more than 2 pct of the total.

Costs Keep Climbing—Undoubtedly, the cost per grievance is creeping higher right along with the workload on arbitrators. In the past several years, many arbitrators have raised their per diem charges—the fee they charge for each work day.

Mr. Strong says the average arbitrator now probably charges $130 to $150 a day; and in some cases top arbitrators will charge $200 or more per day, others only $100. Five years ago the average was about $100 per day, with top arbitrators occasionally getting $150.

The average grievance takes about 2.5 days of the arbitrator's time; this includes hearing and study time, and time spent in preparing his opinion. The cost is about $300.

Is the cost excessive?

Two Sides—The most frequent

answer is "yes and no."

Top labor arbitrator David L. Cole (see cover) admits there are some instances where arbitrators charge excessively. And, he says, as chairman of AAA's National Panel Committee, "We are concerned about these complaints."

But, he points out, these instances are few, and generally the arbitrator is willing to adjust his bill.

And, chimes in Federal Mediation's Mr. Strong, "For every arbitrator charging a high fee, there are dozens who undercharge by not putting down all of their time."

Face Saving Costly—More often, the arbitrators claim, management and labor are to blame for higher arbitration costs.

They all say that there are a lot of cases that go to arbitration that shouldn't. Some of these are "political" or "face saving" coverups on the part of labor or management.

On labor's side, union representatives are elected officials. It is sometimes a matter of showing workers that the union is behind them by giving the grievant "his day in court." For management, it may be a case of showing lower-level management people that the company backs them up.

Can Cut Down—If that's the case, the arbitrators say, then the parties should pare down the procedure (see box P. 54).

Fortunately, this is seldom the case. And with good grievance processing machinery, a company can avoid many cases going to arbitration unnecessarily.

What to Avoid—And many grievances can be avoided altogether, says Mr. Stone, if labor and managements usually hinge on wages and language during negotiations.

He notes that last-minute settlements usually hinge on wage and benefits. Other provisions are carried over from previous contracts. A lot of arbitration cases come up, he says, because parties can't agree as to the meaning of what they meant in the contract.

"In their rush, they use generalities—with both sides hoping it wouldn't become an issue. Inevitably, it does. And only then do the parties face squarely up to the issue," Mr. Stone observes.

This is true of both large and small companies. His suggestion: "Start negotiations early, and watch your language."

Speed Up—FMCS's Mr. Strong also suggests that arbitrators can hear more than one grievance in a day. "From our experience, they can often hear three or four similar cases in a day. While the arbitrator may charge more than for a single grievance, the per-grievance cost will be substantially lower," he points out.

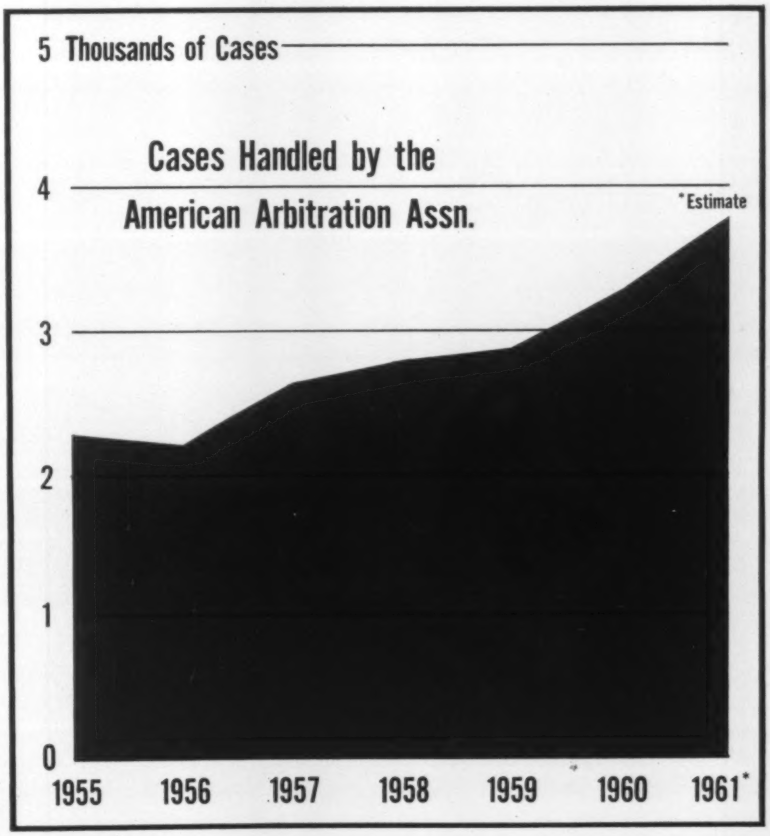
Arbitrator Cole agrees. And he says it is even possible to lump a number of grievances into a single grievance, if they are related. This method is frequently used where the arbitrator is a "permanent umpire" for a company.

He is permanent umpire for a number of companies, including International Harvester Co., Inland Steel Co.—and has even had that role with unions, arbitrating jurisdictional disputes between unions under the merger of the AFL and CIO. He is also a member of the "Kaiser Commission."

Permanent Man—He believes more companies should consider either a permanent umpire or panel of arbitrators to handle their disputes. They would be familiar with the company, union, and the contract—without having to go through an educational process for every dispute. And there would be a better chance to have grievances handled expeditiously.

But even if arbitration costs continue to climb, the arbitrators point out that it is still far less expensive than the alternatives: Costly and time-consuming court litigation, or even worse—a strike.

One Group's Workload Grows



Maintenance Costs Can Be Cut

Incentive Programs Ease Automation Headaches

Equipment maintenance costs continue to climb.

But they can be corrected. Organization and incentive plans will offset rises and reduce costs below present levels.

By K. W. Bennett

- The dawning era of the automatic factory carries new management headaches.

"If your experience has been average, you will find that your (plant maintenance) men are working at about 40 pct efficiency. This means 60 pct loss." The speaker is F. O. Pierson, Celanese Corp. of America, at the Plant Maintenance and Engineering show, Chicago.

Maintenance costs are advancing. More machines in each factory mean higher output, but also higher maintenance costs.

Decade Analyzed—An analysis of maintenance cost gains in an electronics plant was made by J. M. Link, Western Electric Co. It's figured maintenance cost would go up at least 6 pct in the 1950-1960 decade—even if streamlined programs offset increases in materials and labor costs. If higher wage and materials costs are added, the 10-year gain is about 33 pct.

The problem can be cured. Actually, Mr. Link's maintenance crews cut costs from 21¢ per productive manhour in 1950, to 12¢ in 1959.

These statements suggest heavy losses in maintenance costs are growing, though means to correct them are at hand.

Where It's Lost—Where does the money go? Biggest loss is the time mechanics and helpers take to gather tools and materials, and get their instructions, according to Mr. Pierson.

Another factor is idleness at the job site. Too often, four men work where two are needed.

A third cause is Management. Management spots the higher costs. It puts pressure on the foreman to cut machine down-time. He begins sending too many men to each job.

Finally, low skill levels on the part of maintenance workmen, and lack of knowledge in the foreman's case. Mr. Pierson guesses that the average unqualified workman takes three or four tries to learn a particular maintenance procedure.

It Can Be Done—How do you boost the efficiency rating of your maintenance crews? To hit 100 pct efficiency—and it can be done, maintenance engineers believe—an incentive program is necessary. This usually works best on a group basis.

An incentive program, which implies measured work standards, must be backed by an inspection program. A welder rated on inches of weld per day will boost output easily—but quality will suffer.

Draper Corp., Hopedale, Mass., set its maintenance incentives and standards on a simple historical standard. Timekeeping records for various jobs, over the one year period, were averaged to set a standard for each job.

Time Cards Used—With the new standard in operation, timekeeping was arranged so that a time-card was punched at the beginning and end of each assigned job. This prevented a worker tendency to report only times that were over standard.

Draper builds its maintenance control system around a single ticket for each job. About 800 work orders per week are processed by a single dispatcher, using a telephone and tel-autograph, in a maintenance control center.

MANAGEMENT NEEDED: Maintenance costs are going up all along the line. This includes maintaining complex automation equipment and general maintenance work done by millwright crews. (above). It's one of the last frontiers where management can show substantial cuts in costs.

The control center, besides the dispatcher, has one man handling completed orders and compiling management reports. A third reviews work orders to establish new standards.

Maintenance costs have been cut by $500,000 per year, and machine down-time in the plant has been almost eliminated.

Quebec Experience—How do you determine the efficiency of a maintenance department? Six yardsticks are suggested by T. Foulkes, E. B. Eddy Co. of Hull, Canada. Most can be checked by existing time-card data or work orders.

Note the amount of emergency or unplanned overtime; note fluctuations in the maintenance work backlog; compare estimated and actual job costs; compare actual and estimated hours per job; analyze frequency and extent of emergency machine failures; use work sampling and work measurement.

Through these checks, Eddy Co. has cut lost time from 1.3 pct to .9 pct of operating time.

Maintenance costs, particularly in the area of electric and hydraulic, and electronic equipment maintenance, are advancing. Organization for better control can not only offset these rises, but in the average plant can reduce all maintenance cost below present levels.

Liberal Depreciation Gains Support

Congressional support for more liberalized depreciation allowances is growing through comparison of U.S. and foreign industry. Arguments that Russian and Japanese plants are more modern than ours are causing grumblings among some Congressmen.

Support is along the lines expressed by Rep. John S. Managan (D., Conn.). He told the House: "We are far behind other countries in the world in allowing proper provision for the depreciation of our plants. The effect of the current provision is to penalize modernization.

Oxygen Mills Face Smoke Crisis

▪ When U. S. steelmakers saw the first movies after World War II of oxygen steelmaking in Europe, they also saw trouble at the dense clouds of smoke that poured forth.

Last week in Cleveland, the smoke was still one of the hottest of subjects as the city's two integrated steel companies—Jones & Laughlin and Republic Steel Corp. —turned to the new process.

J&L converted three openhearths late last year and the resulting dust stirred protests from nearby residents. Republic then requested permission from the city to convert several furnaces to oxygen but wanted a year's grace to work out the correct air pollution controls.

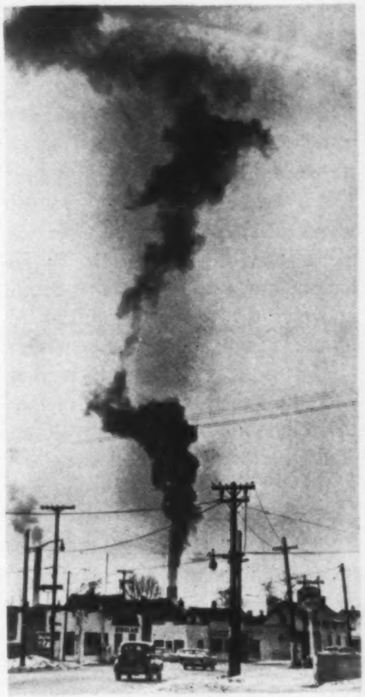
Charges and Counter Charges—A wide open series of public hearings by the city's air and water pollution committee, complete with the glare of TV lighting and photographers flashbulbs, resulted in some thoughtful, and some outlandish, claims and counterclaims. For the councilmen, it was a rare chance for oratory before a packed house. But to unemployed steelworkers and beleagured mill officials, it was a grave matter.

Cong. Charles Vanik flew in from Washington with this charge:

"Industries here and in Youngstown are resorting to the dirtiest steelmaking process in history now because they feel the current recession would force our community to capitulate on its air pollution standards," he said.

Union Backs Mills—Union officials came to the defense of Republic, testifying a year's grace was necessary and urging the homeowner's indulgence.

The city commissioner of air pollution control conceded that the city's antiquated code had no standards covering openhearths. So the mills had not been cited, although incinerator users, foundries, and others had been called in and warned.



SMOKE: Growing Problem.

Mayor Anthony Celebrezze was for the extension, pointing out that industry paid 76 pct of taxes locally, that he felt the offer was in good faith, and the situation must be faced realistically.

Republic's vice president of legal and public affairs, Harold Lumb, pointed out that "nearly every major competitor is using it; Youngstown granted its mills 10 years, Buffalo 8 years, and other areas no limit."

As the controversy started to exhaust itself last week, it appeared the city code would be brought up to date and cover openhearths and Republic would get its year of grace. A new ordinance now being prepared will give Republic until Dec. 31 to install controls.

Price Policy Lures Mg Users

"Development Price" Promotes Magnesium Use

Dow Chemical has offered a "development price" for one alloy. Purpose: To attract new users, particularly automotive.

To date, the policy has had good results.

By F. J. Starin

- About mid-1959 Dow Chemical Co. reached this conclusion: To pull magnesium sales from the depths at which they were languishing required a new, big-volume market.

The target was the auto market, and the means a unique method of pricing of the one alloy it felt could best crack this market.

Even at this point Dow says little about its "development price." But from what can be learned, it appears to be a real success.

Costs to Overcome — The major problem then was that aluminum appeared to be entrenched in auto applications that were suitable for magnesium. So Dow tied the cost of magnesium diecasting alloy AZ91 B directly to competition—aluminum.

The formula: 1.28 times the cost of primary virgin alumium, with an additional 2.5¢ per lb allowance for the cost of developing magnesium parts. Currently, this works out to 29.35¢ per lb.

This price applies to any diecaster on quantities of at least 10,000 lb.

What Success? — How successful has this been? Dow won't comment specifically on the price. But it's predicted now that the auto industry will buy 60 million lb of magnesium diecastings by 1965.

Total magnesium diecasting shipments in 1960, to all industries was only about 7 million lb.

Other official Dow prediction: Volume use of magnesium on large auto transmission parts within 3 years, and average use of magnesium of more than 10 lb per car by 1965.

Volume Needed—At the current volume and price, Dow is not making a profit on sales of AZ91B, says a spokesman. But it would be a profitable item if 60 million lb per year were moving.

What do the diecasters themselves think about this price pattern to generate new markets for magnesium? Generally they are optimistic. All say the approach has been successful, but to different degrees.

One major job shop diecaster, which casts aluminum as well as magnesium, says the development price has created quite a stir in the auto industry. He reports he has an order, which he believes is for testing rather than a production car, for a magnesium blower for an automotive heater.

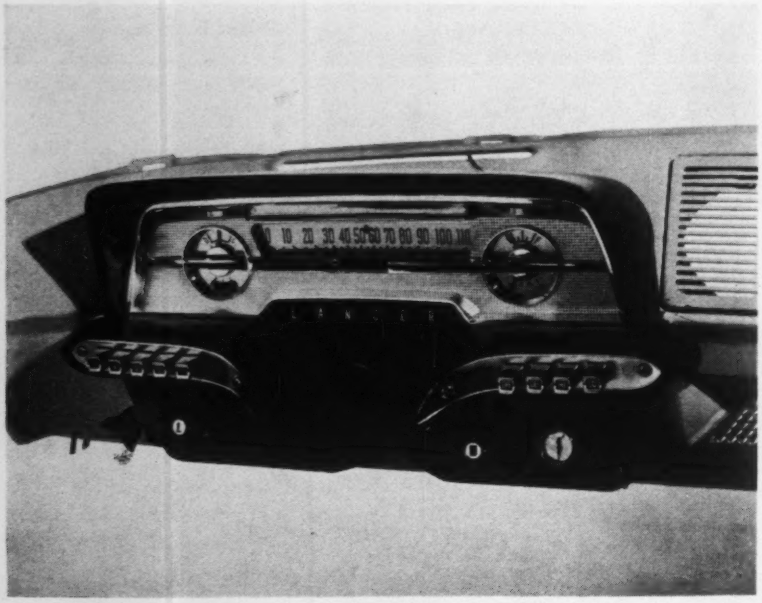
Slow Progress—He is optimistic about the future of magnesium diecasting in the auto industry, but emphasizes that nothing outstanding in the way of orders has developed yet.

Another major diecaster says the Dow development price has been very effective in other than auto markets also. He says the new price enabled him to shift to magnesium for a lawnmower wheel gear profitably. He casts zinc as well as magnesium and aluminum.

Would Dow attempt to apply this formula to develop other markets? Although there is no official position on this, a spokesman thinks not.

Total magnesium production capacity in the U. S. now is about 184 million lb. Primary shipments in 1960 easily topped 100 million lb.

Little of this 1960 magnesium wound up in automobiles. So, considering the expected growth of other markets along with the new auto market—the industry could push its capacity by 1965.



NEW USES: From time to time, magnesium has made advances into the big automotive market. Parts like this instrument panel have taken hold, but Dow's new "development price" gives an added incentive to users.

How Views Vary on Trade Policy

Virtually everyone agrees the U. S. foreign trade policy needs change. But nobody agrees on how it should be done. This is clear in Washington opinions on helping domestic industries meet foreign competition.

Here's how some of the views differ:

The Administration: President Kennedy says the U. S. import problem "is a matter of great concern." The problem is the subject of a 500-page study soon to be released by the Senate Committee on Interstate and Foreign Commerce.

A Kennedy task force studying problems of the U. S. balance of payments suggests the President take a strong hand in dealing with trade problems. The group, consisting of bankers and business professors, says the President should take a firm stand that "we are not going to interfere with the movement of funds between this country and foreign countries by way of exchange controls."

Labor Unions: Unions are adding support to moves for more protection for domestic industry, particularly the metalworking industry. But unions are not about to abandon the "free trade" policy they have followed in the past.

Private Trade Groups: These organizations are up in arms. They say unless we meet the problem our economy will "bleed to death."

Congress: Some Congressmen are calling for import quotas and tariff changes. Others want to set up a committee to make a thorough study of the problem.

Change Trade Policy—But How?

Present U. S. export-import policy is causing concern in Washington.

Opinions are varied on best way to improve situation. Possibilities: Stronger executive action and aid for industries hurt by imports.

By R. W. Crosby

▪ U. S. foreign trade policy must change or it will choke the U. S. economy. This view is heard often these days in Washington, D. C.

From the White House to Capitol Hill, U. S. import-export policy is a matter of deep concern.

Opinions Differ — Everybody wants to change the policy, and with it check the flow of U. S. gold and the hardships of foreign competition. But nobody agrees on how to do it. (See box, above.)

Everyone wants some kind of action. This is the dilemma: What will the U. S. do?

The final answer probably will revolve around President John F. Kennedy, the task force report, and the report by the Senate Commerce Committee.

Flexibility—They lean toward a flexible Federal aid policy to help industries hurt by imports. Also probable: Stronger executive action.

Such a policy calls for a program of adjusting to competition. In other words, it becomes an "adjustment assistance" program. The program, as the Senate Interstate and Foreign Commerce Committee will recommend it, will deal with "emergency needs of individual producers and workers who encounter serious injury traceable to imports." The committee says this will add a "major new dimension" to U. S. trade policy.

Import duties and quotas, like those suggested in bills by Rep. Doman Pucinski (D., Ill.), and others, will not get very far. The objection is that such measures would harm the economies of the foreign nations.

Long-Range Plans—Study commissions, like that suggested by Sen. Everett Dirksen (R., Ill.), and 20 of his colleagues in a joint resolution, will get support for long-range plans. But the urgency of the problem will not let it wait for a 1962 commission report on "The Influence of Foreign Trade Upon Business and Industrial Expansion in the United States."

Groups like the Nation-Wide Committee on Import-Export Policy say a change in wages, foreign and domestic, is the main avenue of solution. The Committee says foreign countries have accepted half the U. S. system of economic progress — the technological half. But these nations have not embraced the other half, higher wages, shorter hours, and better working conditions. The unaccepted half, says the trade group, is causing the import competition.

Wage Issue Sticky — There is little backing for wage action, however. The labor movement in the U. S. is not about to accept wage cuts. Labor abroad is a long way from equaling U. S. wages.

An Adjustment Assistance Act, to protect U. S. industries which would be adversely affected by the rising imports, enters here.

Industry's Foreign Investment: It Has Its Plus Value

Does foreign investment by U. S. industry hurt the national economy? Some factors, the gold crisis, for example, indicate it does.

However, a new government study points out the plus side.

By G. J. McManus

▪ Is the national economy being hurt or helped by the movement of private capital abroad?

Unemployment and the gold crisis have emphasized harmful effects of foreign investment. However, a broad look at the picture shows these facts:

1. Capital outflow is still well below peak levels and only part of the total is going to build American plants abroad.
2. Direct foreign investments by Americans are being roughly balanced by returns of income and fees.
3. Imports to this country from American plants abroad are largely raw materials and are substantially offset by exports to the same plants.
4. Private capital is taking over from government a growing portion of the global development program.

An Unfinished Study—Most of these points show up in a detailed Commerce Dept. report recently released. Department officials caution it is impossible to trace the full implications of international finance. And the most recent periods have not yet been full analyzed.

Nevertheless, the report does cut through much of the smoke that has surrounded foreign investment. Peak year for spending on American holdings abroad was 1957. At that time, U. S. companies invested $4.8 billion in foreign interests. This compares with $3.9 billion in 1960 and $3.7 billion in 1959.

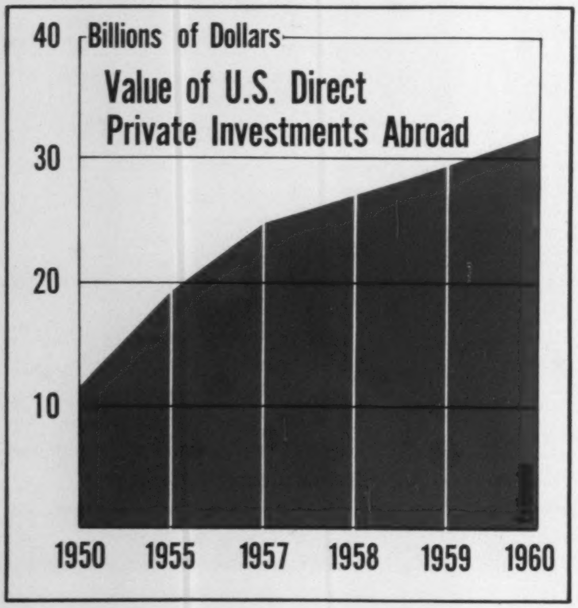
Other Sources—Of the $4.8 billion for 1957, only $2.2 billion came from this country. The rest was provided from earnings of the foreign subsidiaries; from foreign financing or from other means that did not take dollars out of the U. S.

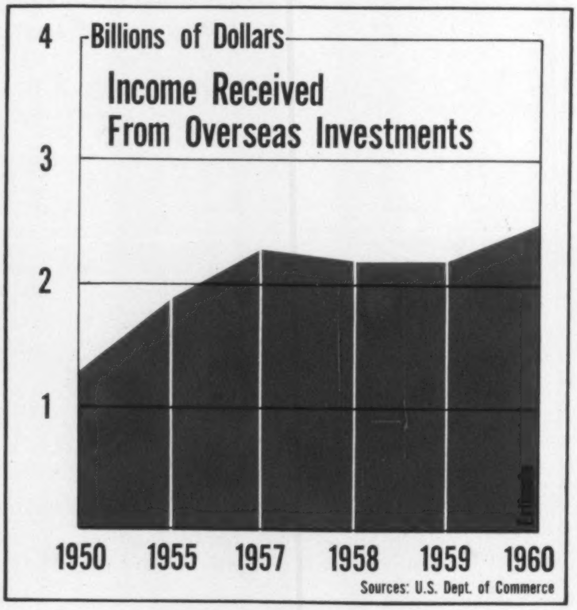
The $2.2 billion supplied for American plants abroad is also much smaller than the total outflow of capital dollars. In 1957, this figure was $3.1 billion. The excess of nearly $1 billion represents portfolio investments, loans to foreign interests and other movements not connected with the building of new American plants abroad.

Balancing the dollars American companies sent abroad to build new plants in 1957, these companies got back $2.2 billion in foreign earnings and another $241 million in fees and royalties. Added together, these two are slightly higher than this country's capital output.

Capital Outflow Down—Foreign earnings have held at 1957 levels in

U. S. Investments and Profits Climb Overseas





Sources: U.S. Dept. of Commerce

more recent years while the capital outflow has dropped sharply. In 1958 and 1959, American companies earned about $1 billion more than they spent abroad. The net gain is really even higher because American companies have been leaving another $1 billion abroad each year for reinvestment.

And, finally, the foreign buildup is so recent that depreciation is not yet contributing a normal share to capital spending. Despite more liberal tax laws abroad, U. S. companies are getting a higher percentage of the capital dollar from depreciation in this country than overseas.

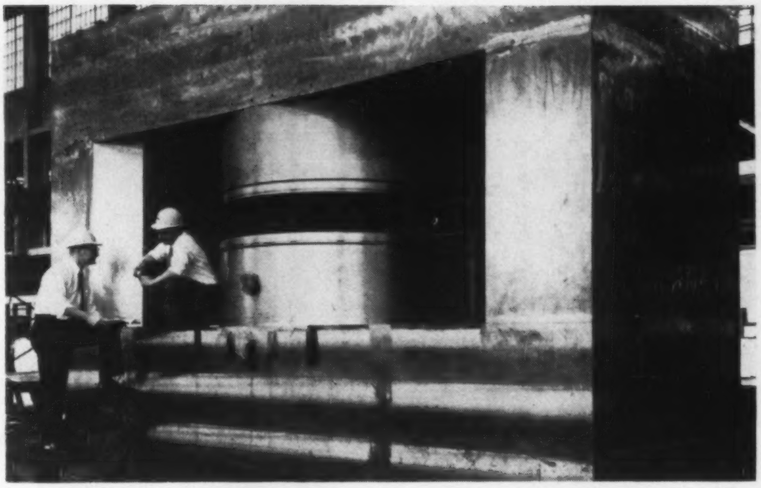
A look at one company indicates how foreign operations are sustaining themselves. Joy Manufacturing Co. is expanding in Canada, France, England, Australia and South Africa. Except for the French moves, all funds are being provided from foreign earnings or foreign financing.

Spending Offset—In the case of France, Joy last year spent $1.8 million for a new plant. This was offset to a large extent by $1 million collected from foreign subsidiaries as fees and related charges.

Perhaps the most striking thing about the new government figures is the way they tie foreign investment to our export-import picture. In 1957, one-third of American imports came from U. S.-owned plants. And better than $2.5 billion of our exports went to American operations abroad.

Mining and petroleum operations supplied about two-thirds of the $3.7 billion imported in 1957 from American plants abroad. With a growing dependence on outside sources for raw materials, imports of iron ore, bauxite, petroleum and others figure to increase.

U. S.-Owned Source—However, this drain is cushioned by American ownership of material sources. Income and royalty remittances are part of the picture. Another big help is the fact that U. S. plants abroad have been doing much of their purchasing in this country.



COLLEGE EXAMINATION: Dr. R. S. Tickle (left) and John Bardwick, both of the Univ. of Michigan, examine the magnet core of a variable energy cyclotron. The core was built by Bethlehem Steel Co.

Bethlehem Delivers 'Atom' Assignment

▪ Bethlehem Steel Co. has shipped a magnet core of a variable energy cyclotron to the Univ. of Michigan. The 310-ton unit will be a key portion of an "atom smasher" due for operation at the school in 1963.

The core was built by Bethlehem for the University under a contract with the Atomic Energy Commission. It will be used for research on the nuclei of the heavier elements. When completed, it will have a continuously variable energy range of 15 to 40 million electron volts.

According to Bethlehem, the entire unit will be housed at the new laboratory facilities now under construction at the university's North Campus.

Completely Bethlehem — The magnet core components for the cyclotron were fabricated on some of the largest planers and vertical boring mills in the country. It was forged, machined and completely assembled at the company's Bethlehem, Pa. plant.

Specifications called for Bethlehem to finish these components to thousandths and micro inches.

A cyclotron is primarily a research instrument which permits physicists to alter the atomic nucleus in order to study nuclear phenomena.

Heaviest Parts—Bethlehem says the heaviest individual parts in the magnet core of the "atom smasher" are the top and bottom members of the magnet frame. These are called the yoke. Each yoke weighs approximately 105 tons.

When joined with vertical spanners by large dowel pins and studs, they form a magnet frame measuring 224-in. long, 83-in. wide and 143-in. high.

An unusual feature in the design of this cyclotron is an air gap of one-half-in between pole and pole tip. The poles of the cyclotron are of the spiral ridge type. Such construction provides a magnetic field with properties that enable the emerging particles to be better focused than with the more conventional uniform field cyclotron.

Thermoelectricity Goes Commercial

NOW IN USE: A 100-watt thermoelectric generator, produced by Westinghouse Electric Corp., is now in use at the Northern Illinois Gas Co. It is one of the first industrial applications of such generators. D. W. Gunther (right), general manager of Westinghouse's semiconductor dept., and S. R. Milliken of NIG examine one of the generators.

Kennedy Pledges Tax Reform Program

Industrial expansion through investment in new plant and equipment has become the keynote of John Kennedy's New Frontier tax reform program.

A proposal for new depreciation allowances or similar tax incentives will be in the hands of Congress by early February.

President Kennedy, in his State of the Union message this week, promised a measure to offer industry "tax incentives for sound plant investment." Thus, the President plans to encourage expansion with a tax break to those companies willing to invest in plant modernization.

The tax incentive measure will be one of a series of measures that will go from Mr. Kennedy to Congress before mid-February. Among the other measures he promises will be detailed plans for area redevelopment, home construction, minimum wage expansion, increased natural resources development, and price stability encouragement.

1960 Steel Production Is 6th Highest Output

Steelmaking furnaces in the United States poured 99,277,760 net tons of ingots and steel for castings during 1960. It is the sixth highest annual output in history, according to the American Iron and Steel Institute.

The total was over 5.8 million tons above 1959 production, and only 15 pct below the 1955 peak of 117 million net tons.

The output of the second half of 1960 totaled 38,523,665 tons, compared with 60,754,095 tons in the first half. Fourth quarter production was 18,876,320 tons, against 19,647,345 tons in the third.

December output totaled 5,836,000 tons, compared with 6,171,940 tons made in November.

Output from the nation's blast furnaces totaled 67,320,129 net tons during 1960. The total exceeds that of the previous year by 10.8 per cent, and ranks as the sixth highest annual output recorded.

December blast furnace production came to 3,876,776 net tons, compared with nearly 4.2 million tons in November and 7.6 million tons during December 1959.

Stainless steel output last year totaled 1,003,637 net tons, down slightly from the 1.1 million tons in 1959.

Production of alloy steel other than stainless totaled 7,392,171 net tons, compared with nearly 7.8 million tons in 1959.

Cliffs Starts New Pelletizing Project

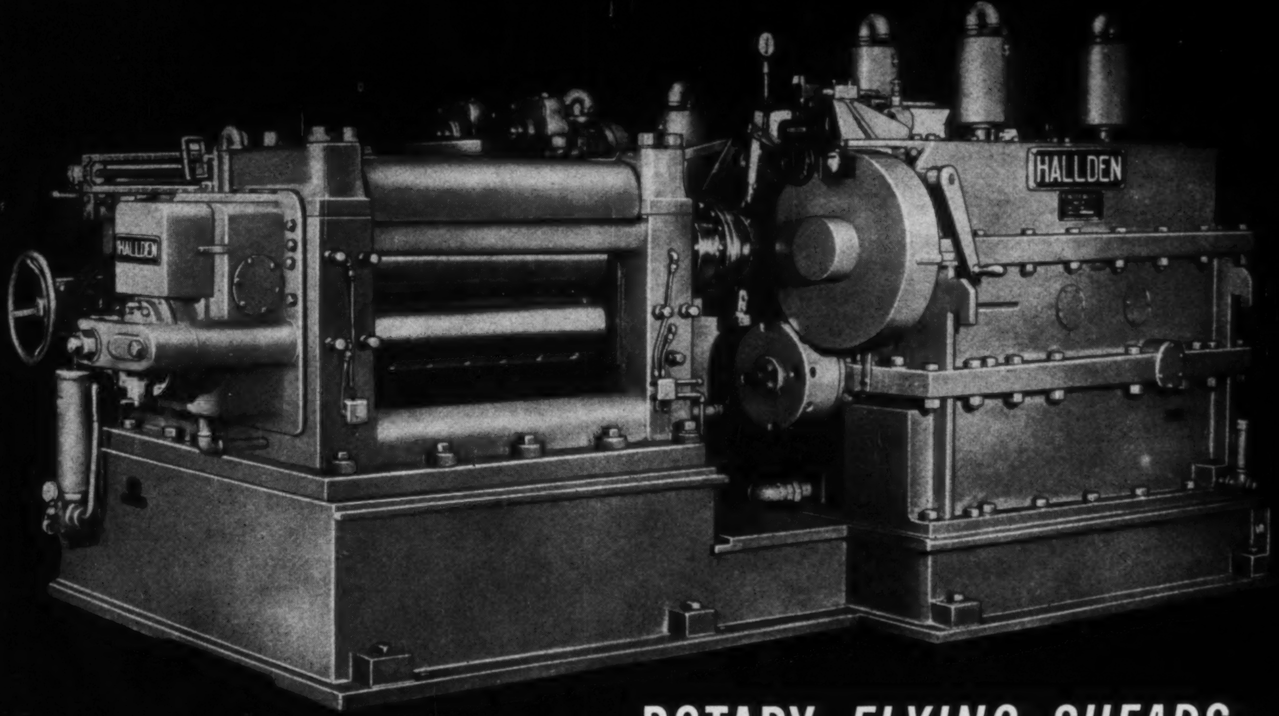
Pelletizing of Lake Superior district iron ore is in for another jump with announcement by Cleveland Cliffs Iron Co. of another pelletizing plant at Negaunee, on the Upper Peninsula of Michigan.

Cleveland Cliffs has two other pelletizing plants nearby, the Humbolt and Republican mines. The new operation, called Empire Mines, differs in that ore is magnetic and thus more easily separated. Initial capacity will be over a million tons of pellets per year, bringing Cliffs total capacity there to 3.25 million tons per year by 1963. Cliffs will be operator of Empire and part owner with two or three as yet unidentified steelmakers.

"No Strike" Clause

The U. S. Supreme Court will soon rule on whether Federal or state courts have the power to enforce "no strike" agreements between union and management.

Federal District Courts claim they have power to enforce such agreements. Unions claim only state courts have this power.



ROTARY *FLYING SHEARS*
with "PUSH BUTTON" CONTROL

for HIGH PRODUCTION.... up to 8 cuts per second
ULTIMATE ACCURACY.....

- SYNCHRONIZED
- MICROMETER ADJUSTMENT
  for both cut lengths and synchronization
- ADJUSTMENTS "ON THE FLY" if desired
- TORQUE CORRECTIVE GEARING
- DYNAMICALLY BALANCED

HALLDEN

The world's leading machinery manufacturers rely on Hallden shears in their process lines

THE HALLDEN MACHINE COMPANY • THOMASTON, CONNECTICUT
Associates: The W. H. A. Robertson & Co., Ltd., Bedford, England

INDUSTRIAL BRIEFS

Northern Rights—La Salle Steel Co., Chicago, has concluded a license agreement with The Canadian Drawn Steel Co., Ltd., Hamilton, Ont. Covered in the agreement will be manufacturing and sales rights for STRESSPROOF steel bars as well as products made by the "e.t.d." (Elevated Temperature Drawing) process.

Joining the Rush—U.S. Industries, Inc., has entered the high-energy-rate forming machinery field. USI's Clearing Division will manufacture and sell high-energy-rate metal forming machinery developed by the Hermes Corporation of Pomona, Calif. The machinery, to be marketed under the Clearing-Hermes name, will produce metal shapes by imparting energy at an extremely high rate.

Automation Adds—Automation Industries, Inc., manufacturer of ultrasonic, electronic, and magnetic products, has acquired Amco Incorporated of Abilene, Texas, an integrated fabricator of aircraft and missile components. Automation president Corwin D. Denney says the acquisition adds approximately $1,000,000 to the corporation's backlog and should increase earnings next year by $100,000.

First for Coast—The American Foundrymen's Society will hold the 1961 Castings Congress in San Francisco, May 8-12. It's the first Congress to be held on the West Coast. Requirements of aircraft and missiles manufacturers will be stressed. More than 80 papers have already been committed.

Research Rewarded — Three General Electric Co. research experts from Schenectady have been honored by the American Institute of Mining, Metallurgical, and Petroleum Engineers. Dr. Karl T. Aust and Dr. J. W. Rutter share the Mathewson Gold Medal Award for "outstanding technical papers." They will receive it at the AIME convention in St. Louis Feb. 26-March 2. Dr. David Turnbull was named to give the Institute of Metals Division Lecture.

Now Casting—Nominations are open for the 1961 Doehler Award which recognizes outstanding contributions to the advancement of the die casting art. A plaque and cash honorarium of at least $500 is awarded annually by the American Die Casting Institute.

Galvanized Effort — A research and development campaign to expand the uses of hot dip galvanizing has started. Sponsors are the American Zinc Institute and the American Hot Dip Galvanizers Association.

Prize for Progress — The Metal Powder Industries Federation is sponsoring a new award. Known as the "Powder Metallurgy Progress Award," it will be given to an individual or institution most advancing the industry.

Steel Plate Chiefs — Edward G. Cole, Jr., president of R. D. Cole Manufacturing Co., Newnan, Ga., is the new president of the Steel Plate Fabricators Assn., Inc. A. L. Davis, president of Pennsylvania Engineering Corp., New Castle, Pa., was elected vice president at the annual meeting. F. E. Seery, assistant vice president of General American Transportation Corp., Chicago, is treasurer, and J. Dwight Evans, executive director of the Association, is secretary.

"Welcome aboard, Holcomb. Ready to get lost in the shuffle?"

IHEA Elects—H. J. Pugsley of Swindell-Dressler Corp. was elected president of Industrial Heating Equipment Assn. at the annual meeting last week in Detroit. T. H. Wickwire, III, Trent, Inc., was named vice-president. New directors are: M. R. Ogle, Drever Co.; G. C. Wilsher, Holcroft & Co.; and T. H. Wickwire, III.

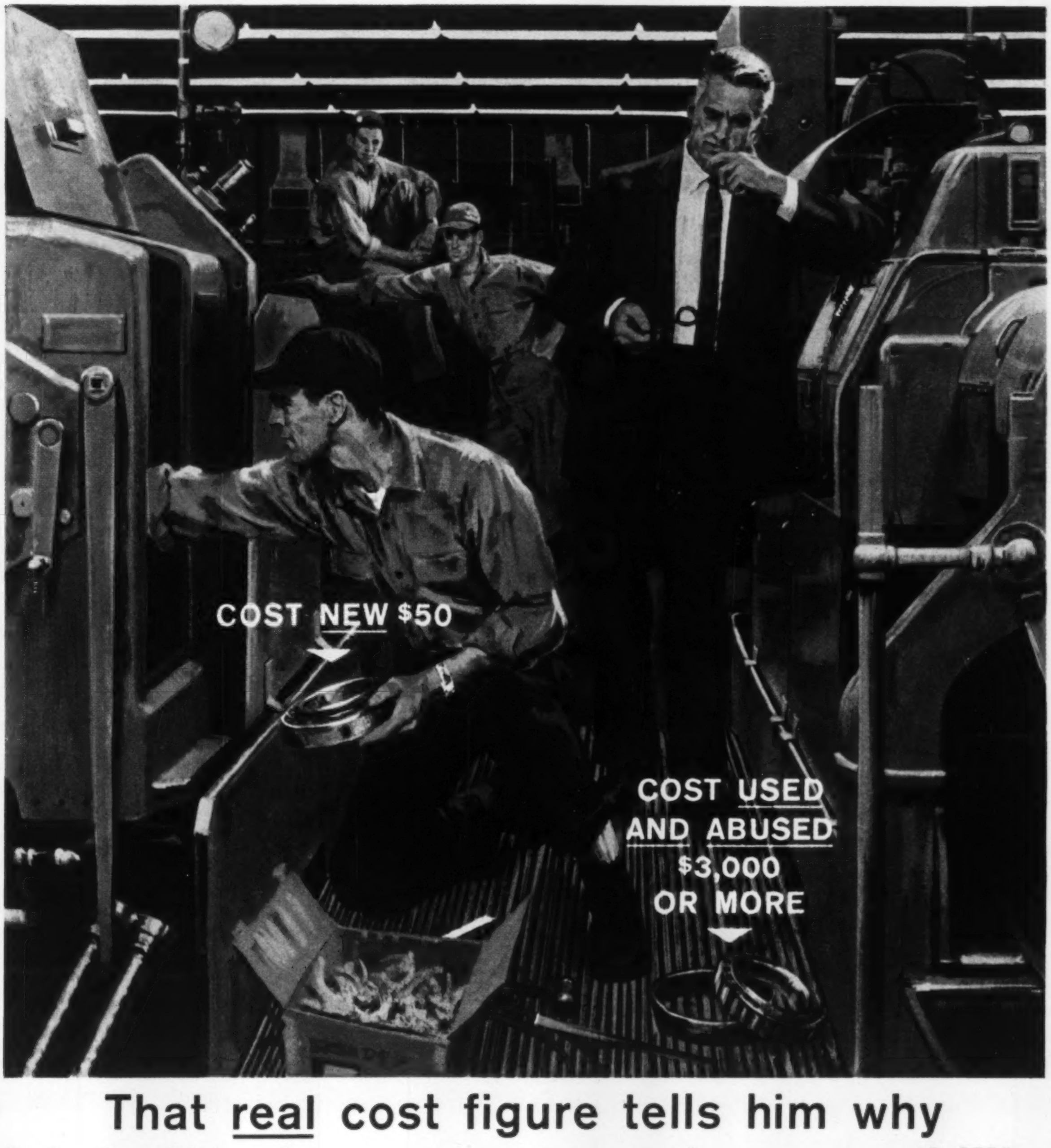
Chicago Choices—Charles Zapf, secretary of Chas. Zapf & Co., Evanston, Ill., was elected president of the Tool & Die Institute at its annual meeting. Paul Prikos, president of Prikos & Becker Tool Co., Skokie, Ill., is vice-president. James Coduti, Hudson Tool & Die Co., Chicago, is treasurer.

Off to Austria—The fourth International Powder Metallurgy Congress is scheduled for Reutte, Tyrol, Austria, June 20-24, this year. Delegates from 37 nations, including a large U. S. group, will attend. Topic of the Congress is "Powder Metallurgy in the Nuclear Age."

One for Science—Two major engineering — scientific groups have joined forces. The 40,000 member American Society of Tool and Manufacturing Engineers is now affiliated with the American Association for the Advancement of Science.

Spring Line—Robert G. Lambrecht, Automatic Spring Coiling Co., Chicago, was elected president of the Chicago Association of Spring Manufacturers. Edward J. Dudek, of the Wm. Dudek Manufacturing Co., is vice president, and Walter K. Schuch, of The Associated Spring Corp., is secretary-treasurer.

Canada First—Metal & Thermit Corp. is building Canada's first detinning plant at Hamilton, Ont. The $1 million facility will be operated by the company's Canadian subsidiary, M & T Products of Canada, Ltd.


COST NEW $50
COST USED AND ABUSED $3,000 OR MORE

That real cost figure tells him why lubrication is a management responsibility

When a bearing fails, a new one will cost, say, $50. But if that failed bearing shuts down your entire production line, the resulting downtime and lost production can run the bill up to $3,000 or more. And that's your *real* replacement cost.

Only management can effect a cure for this severe bite out of profits. Here's why:

A failed part is only a symptom; very often the *cause* is improper lubrication. The part can be replaced but the cause remains. The machine will fail again.

Like any plant-wide operation procedure, an organized lubrication system—which will prevent the vast majority of equipment failures—has to come from the top. For this reason, lubrication is a management responsibility.

For a preview of what Organized Lubrication can accomplish in your plant, we invite you to see our new movie "Stop Loss with Organized Lubrication." For an early showing, write:

Texaco Inc., 135 East 42nd Street, New York, N.Y., Dept. IA-171.

TEXACO

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

take your pick

. . . select the type and size of steel you require . . . any amount, in any variety . . . and your ***Steel Service Center*** can provide it, one—two—three! ■ A phone call is all it takes to get Steel Products Delivery . . . fast . . . and dependably! ■ For example, your nearby ***Steel Service Center*** is ready to take care of your needs for such Inland Steel products as Ti-Co® galvanized sheets or coils, Ledloy® leaded steels, 4-Way® Safety Plate, bars, flat-rolled and structural steels. ■ Wide selection and speedy delivery are but two of the many advantages offered by your ***Steel Service Center.*** It will pay you to get *all* the facts. Why not call today.

STEEL
SERVICE CENTER
INSTITUTE

INLAND
STEEL
COMPANY
30 West Monroe Street
Chicago 3, Illinois

Are Stable Prices Important?

Despite present price softness, there are some signs a period of stable prices may be emerging.

If so, it could be an important boost to buying of U. S. goods both here at home and overseas.

■ Costs and prices are two business problems currently getting plently of attention.

While their own costs are rising, businessmen often face price softness in their markets.

"Buyers are doing everything they can to break down the present mill price level," says a weary steel sales manager. The chaotic condition in some nonferrous prices is another case in point (See IA, Jan. 26, p. 43.)

Long-Term Steadiness?—Despite short-term uncertainty, prices may be heading toward a long-range period of stability. Some economists believe a new pattern of relatively stable prices is emerging. If it is, they reason, the effect will be beneficial on sales both here and overseas.

"The importance of stable prices to sustained economic growth and successful international competition must be recognized," says the Federal Reserve Bank of Kansas City in its latest business review.

To understand present price trends it's necessary to go back a little. First, industrial capacity has increased to a point where supply is no problem. The business turndown which started in mid-1960 is also depressing demand. These influences tend to pull prices down, even while raw material and labor costs are moving up.

New Atmosphere — In addition, with some industrial capacity now idle, there's less incentive for capital spending. Because of these factors, the bank points out, there is "a new atmosphere in which capacity and potential supplies of raw materials and finished goods are larger relative to total consumption than earlier in the postwar period."

The result: More competition. Greater efforts by industry to control costs and reduce upward pressure on prices. Renewed interest in keeping U. S. prices more in line with those of overseas manufacturers.

Growth and Jobs—Price stability is clearly an important factor in both competing and achieving real economic growth at home. Failure to grow and greater amounts of unused resources became major economic problems in '60, the bank notes. "The impact of the problem is highlighted by the failure of the economy, for the first time since World War II, to achieve a high level of resource use during a period of cyclical upswing."

Included in unused resources are the unemployed—where the jobless in December numbered more than 6 pct of the civilian work force. Effective use of manpower in the early 1960's depends on raising the over-all growth of the economy.

Plan College Recruiting

■ Some of the money industry spends on college recruiting programs, is going astray.

If your company has a program it might be a good idea to review it—especially the format of your recruiting brochures. A survey made by the University of Michigan's Bureau of Industrial Relations of 135 brochures shows why.

Work and Hours Overlooked — "With the exception of a few public accounting firms, you could read all these brochures and never get an inkling that the company expected a good day's work," says Bureau Director George S. Odiorne. Artlessness and shoddy planning characterize most brochures students receive, he adds.

Some of the complaints:

Not one of the brochures provided a complete index of job openings and kinds of degree holders who might be considered for them.

Meager Facts — A student must guess—or sign up for an interview to find out—whether or not he will travel a lot, how he gets ahead, what kind of a community he might live in, and what are the basic business policies of a prospective employer."

Says Dr. Odiorne: "Brochures which combined the preciseness and completeness of a college catalogue with the zest and glamour of the recuiting brochure as it now exists could achieve substantial savings in the cost of recruiting."

When reliable welding comes first so do M&T Murex Electrodes

THAT HUGE TRACTOR is a mountain of earth-moving muscle capable of 67,000 pounds of pull. An average tractor is dwarfed by this monster: 23 feet long and weighing over 75,000 pounds with equipment. On its seven-roller tracks, it can claw into the earth, push huge boulders, maul tons of dirt.

THE PRINCESS SOPHIE is just as much a giant of the sea lanes. When loaded, it displaces 100,000 tons—more than any passenger or military ship afloat. The latest electronic equipment, a foam fire-protection system, a complete hospital and air-conditioned quarters make it one of the safest, most luxurious supertankers ever.

Another interesting fact about these two giants: both obtained the proper joint strength through welding with M&T Murex electrodes. It's interesting, but not unusual. You'll find that this brand is increasingly in evidence at demanding jobs everywhere. It represents one of the broadest lines in the industry: over 1000 types and sizes for virtually any type of application—as advantageous on the routine jobs as on the extraordinary ones.

To get the whole story on this outstanding line, call in your M&T welding specialist. Or write for your copy of the helpful M&T Murex Electrode Selector.

M&T

welding products · plating products
minerals · coatings · chemicals · detinning

METAL & THERMIT CORPORATION, General Offices: Rahway, New Jersey

Foreign Car Price Cuts Coming

U. S. compacts crippled foreign car sales in 1960.

Renault cut its Dauphine price to meet the challenge. Other foreign car makers may follow suit.

By A. E. Fleming

▪ In the past year the question, "What will U. S. compacts do to foreign car sales?" has been answered.

In most cases, sales of imports have been crippled.

Last week, in a move that should set a trend, Renault cut the price of its most popular model, the Dauphine, by $200 and its 4CV by $197. Only last October, the Dauphine price was dropped $60 in New York.

Besides the price cut, the French automaker extended its warranty to 12 months or 12,000 miles compared with the former six months warranty. American cars have had the 12-12 since last fall.

Other Fields — Renault's move signals price reductions among other imports. There are indications it will affect even the domestic compact market. Dodge Lancer reduced prices this month and last week came out with a two-door sedan in its top series.

There are two factors behind Renault's move. First, to regain the sales lost last year (down to 65,000 from 90,000 in 1959; 1961 aim is 75,000). Second, to give U. S. automakers thinking of competing in the small-small class (right now, Ford and Chevrolet) something to mull over.

Big weapon — Foreign automakers have said repeatedly that price is their big weapon in a fight with domestic producers in the U. S. market. Now it appears they are ready to dust off the artillery.

This is where Ford may have an advantage over Chevy. There are indications its minicar could be wholly manufactured and assembled in Europe, thereby matching Renault in price advantage.

Awaiting Word — Volkswagen, still king among the imports, can wait to see if Renault's price cut pays off. But word is VW has been contemplating a reduction, against its dealers' wishes. It was the only major foreign make whose sales in 1960 climbed beyond 1959.

As a clue to the renewed competition stirring in the small car area, this is what Renault president Maurice Bosquet says: "A wholly new market, virtually untapped by any motor vehicle maker, exists for an economy car at the price level at which the four door Dauphine will now be sold."

$1385 in East — The Dauphine now goes for $1385 on the East Coast, the 4CV for $1095.

In early spring, Renault will tease American customers with a new model, the Gordini, a $1650 four-door sedan with a peppier (40 hp) engine, 4-speed gearbox, adjustable seat brakes and luxury interiors.

Ford May Try Stainless Mufflers

Ford may switch from aluminized to stainless steel mufflers before the end of the 1961 model run. The switch has already been made on the Thunderbird.

Too costly for a car like Ford?

Maybe so, but cost isn't the whole point. Publicity and promotion count high. Getting the jump on Chevy and Plymouth with a stainless muffler would give Ford quite a talking point. It's a matter of deciding whether or not the cost penalty, over $1.50 a muffler more than aluminized types, is worth the ballyhoo.

Up to Promotion — Says a Ford engineer: "Whether the stainless muffler goes on is a matter of how hot the promotion boys are for it. We've been playing around with ceramic coated mufflers a year and a half (Rambler introduced them in 1961 models).

"In fact, we're testing every kind of corrosion resistant surface imaginable. But there's no doubt of a cost penalty on stainless, just as there is on Rambler's ceramic. And it's a big one."

The Differences—A big question is: "Which is the better muffler, stainless or ceramic, and what's the cost difference?"

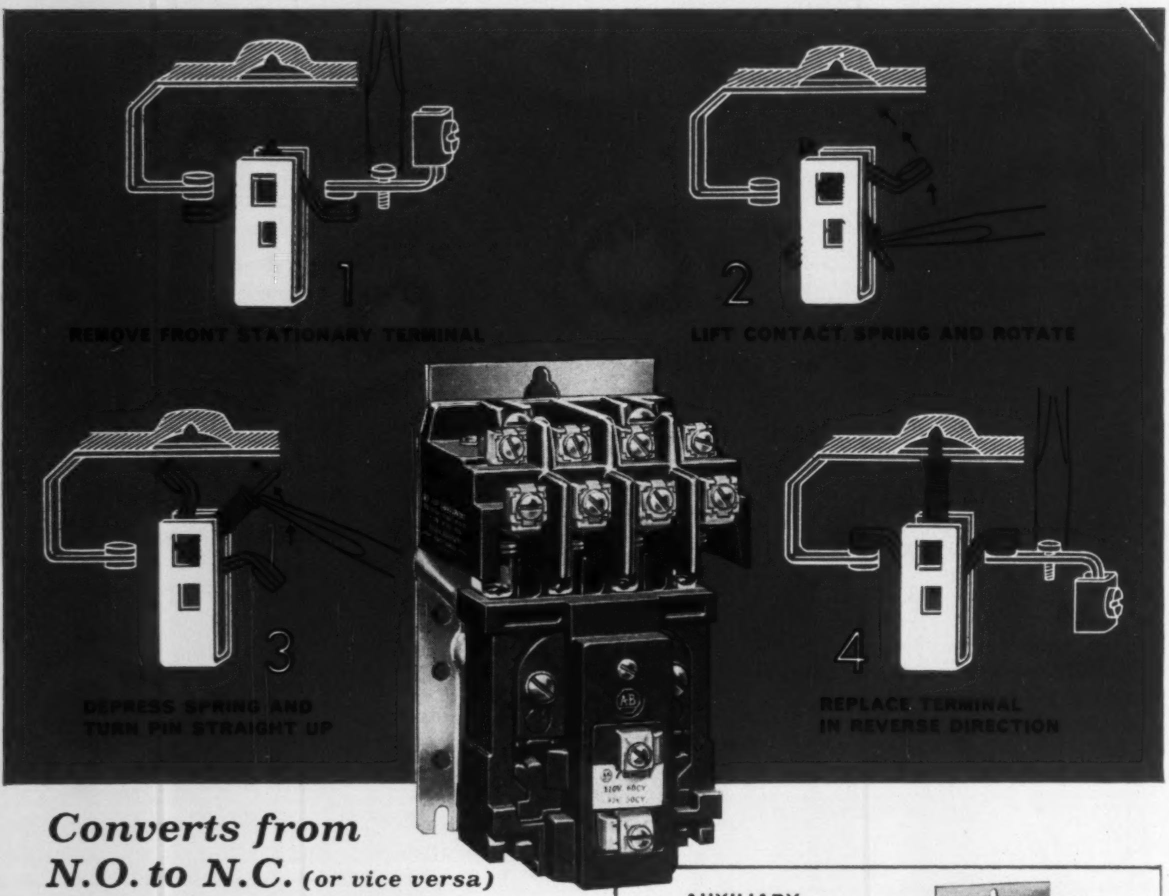
The IRON AGE asked a muffler maker, who came up with this after running a series of corrosion tests: Rambler's ceramic mufflers will withstand corrosion up to five years or 50,000 miles; Thunderbird's stainless type will last three years or 30,000 miles.

The muffler maker's reason: the T'bird muffler is only partially coated with stainless. "The insides will go first," he says. "There'll probably be some complaints about noise."

As for price, it seems to be a stand-off. Reportedly, the kind of stainless used by T'bird runs about 26 cents a lb. Seven lb are needed for one muffler.

Four simple steps to contact changeover

Total time—not more than 60 seconds

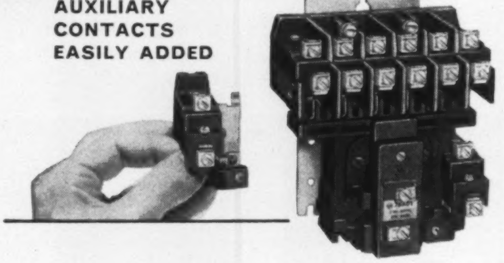

1
REMOVE FRONT STATIONARY TERMINAL
2
LIFT CONTACT SPRING AND ROTATE
3
DEPRESS SPRING AND TURN PIN STRAIGHT UP
4
REPLACE TERMINAL IN REVERSE DIRECTION
A-B

Converts from N.O. to N.C. (or vice versa) in 60 SECONDS!

You'll be truly amazed at the ease of converting the contacts on these Allen-Bradley Bulletin 700 Type BR relays. Using only a screwdriver, as shown above, the contacts can be changed from N.O. to N.C. (or vice versa) in four easy steps—that take only *60 seconds!* Such convenient flexibility is a "natural" for reducing relay inventories.

The Type BR relays are built to provide *many millions* of trouble free operations. With the built-in permanent air gap, magnetic sticking is impossible. And the molded coil is impervious to *all* harmful atmospheres. Of course, the double break, silver contacts *never* need attention. If you use relays, there are money savings for you in the Type BR relay line!

AUXILIARY CONTACTS EASILY ADDED



Type BR relays are available with 2, 3, 4, or 6 poles—but as a valuable bonus, one or two fully rated poles can be added to the base of each relay—even in the field. It's a simple addition that takes only moments.

ALLEN-BRADLEY | ***QUALITY MOTOR CONTROL***

Member of NEMA

Allen-Bradley Co., 1341 S. First St., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

N.Y. Recruits West Industries

Californians Told of Eastern Business Climate

New York's Governor Nelson Rockefeller recently journeyed to California. His purpose: To attract industries eastward.

California may make the same trip East to tell of its business potential.

By R. R. Kay

▪ "This is no carpetbagging operation. I'm here to sell New York's business climate, not to steal California industries," New York's Governor Nelson Rockefeller told The IRON AGE.

The Governor came to Los Angeles recently in a hands-across-the-continent spirit. He opened a branch office of his state's Dept. of Commerce. Aim: To sell California industrialists the idea that New York is a good place to expand. "Your branch plants will be welcomed with open arms," he says.

California is a hunting ground for industrial development men. Why? Its industrial growth, especially during the last ten years, is well known throughout the country.

Other States Too—Texas, Illinois, Oklahoma, Massachusetts, Hawaii, and many other states have made aggressive pitches for California companies to open branches in their states. And it's paid off for them.

Industrial development men realize that, in order to expand, California and many West Coast-based companies must open branch plants east of the Rockies. That's where the big markets remain. With an eastern plant, a Farwestern manufacturer beats the high West-to-East freight rates.

One Point—All this jockeying for branch plants proves one thing: California has arrived as a major manufacturing area.

But along with economic maturity, there are headaches. Industry in California is still expanding rapidly. If the state's economy is to keep booming, it must find jobs for 550 more persons every day. That means the state will need two million new jobs in the next ten years.

What to do about it? The IRON AGE asked California's Governor Edmund Brown: "What are you doing to bring industry to California?"

Brown's Plans—His reply: "We now have an economic development agency. We intend to move ahead to the actual business of promoting new industry."

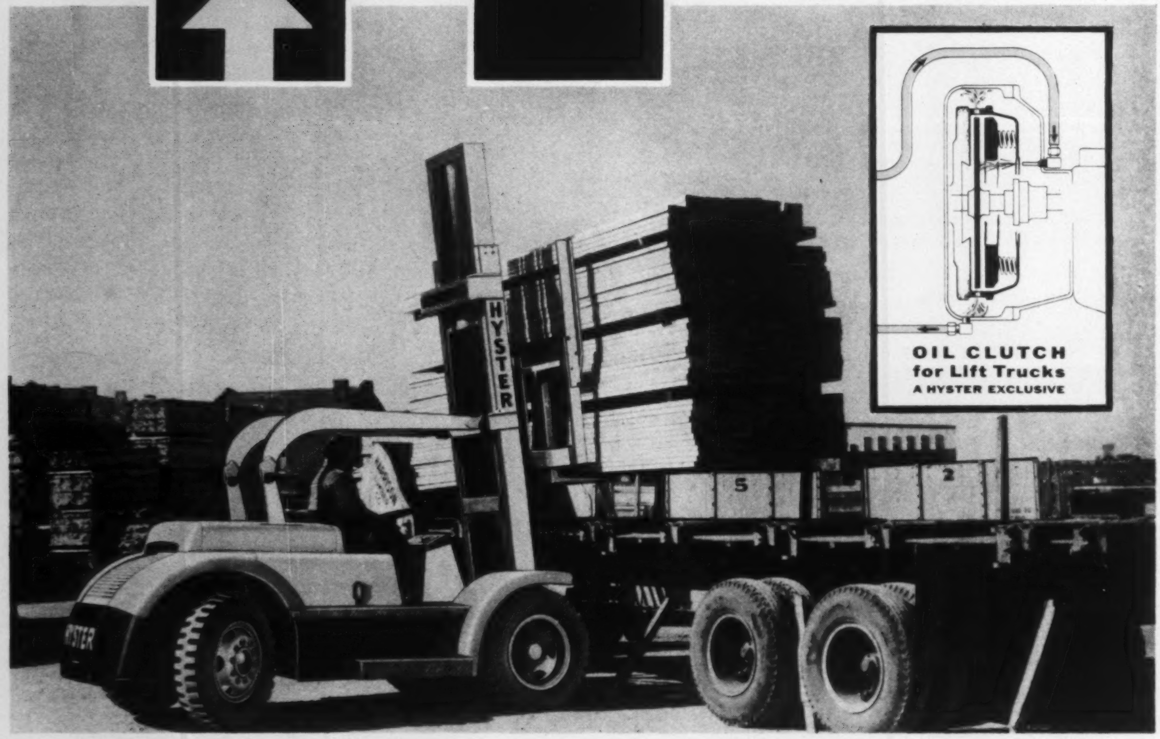
The Governor has a real problem on his hands in finding new jobs for his state's exploding population. He predicts that California will move past New York in population by 1963.

In fact, he says he may do the same thing Governor Rockefeller is doing right now—hit the road to attract more manufacturing industries to his state. Governor Brown believes the time to cross the plains is now. The expanding Western markets are real incentives for Eastern producers to set up shop in California.

Rail Car Will Be Missile Launch Pad

THREE-WAY-STRETCH: First missile-firing railroad car is readied for shipment to Boeing Airplane Co., Seattle, where launching gear will be attached. Car built by ACF Industries, Inc. and American Machine & Foundry is made shockproof with three-way cushioning.

HYSTER



Now! Long Life Oil Clutch standard on 15,000 to 20,000 lb. trucks —

Only HYSTER® has it!

Exclusive Hyster oil clutch is capable of up to 10,000 hours service.

Proved by years of actual customer operation—preferred by most users—on trucks of 15,000 to 20,000 lbs. capacity.

Now standard equipment on Hyster trucks in this class — with gasoline, LP-Gas, or diesel power. Optional and exclusive on Hyster pneumatic tire trucks from 6,000-12,000 lbs. capacity.

Clutch plates bathed in oil—dissipates *heat*—reduces *wear* and down-time—gives extra smooth inching and engagement.

Call your Hyster dealer, or write for literature.

INDUSTRIAL TRUCK DIVISION—Lift trucks, mobile cranes, straddle carriers
TRACTOR EQUIPMENT DIVISION—Construction and logging equipment
MARTIN TRAILER DIVISION—Heavy machinery hauling trailers
INTERNATIONAL DIVISION—Overseas manufacturing, sales and service
Manufactured in: Portland, Oregon (Home Office) • Danville, Ill. • Peoria, Ill. • Kewanee, Ill.
Australia • Brazil • England • France • The Netherlands • Scotland • Union of South Africa

NEWEST TRUCKS — NO INVESTMENT
Custom Leasing Plan
CALL YOUR HYSTER DEALER

HYSTER COMPANY
INDUSTRIAL TRUCK DIVISION
P. O. Box 847 • Danville, Illinois

Orders Keyed to Tax Reform

Builder Says Depreciation Action Vital to New Business

Cincinnati Milling executive says 1961 outlook is dependent on Government tax policies.

1960 business was below normal and a stimulus is needed to encourage modernization.

By R. H. Eshelman

▪ One of the pioneers and major policy spokesmen of the machine tool industry, Frederick V. Geier, chairman of the board, Cincinnati Milling Machine Co., calls for a complete revamping of public policies on modernization.

"Today," he says, "modernization of America's aging industrial machinery hinges on our Government's international, economic and tax policies. For several years their impact on the industry has been negative. The industry outlook for 1961 depends on how soon these policies become clear and how their overall balance tips the scale of capital expenditure.

"The machine tool industry committed itself to heavy costs for product development last year and for new product tooling in 1961 to offer industry more productive, cost reducing machines. That technical job is being done, and done well. Recovery of machine tool sales now depends on constructive national economic policies."

Slow First Quarter—Mr. Geier feels that with current business at a hesitant pace, the industry may face a slow first quarter. The negative effect on capital expenditures of the current downdrift of the general economy may well be offset in the second quarter by an increased demand for more efficient low-cost production.

Still, he sees a close parallel between the machine tool picture and metalworking generally.

Industry results for 1961 will depend on how soon an upturn occurs to restore the industry to a healthy level of orders and production.

Reviewing the past year from viewpoint of the machine builder, he finds a rather mixed picture.

Below Normal—Again in 1960, American metalworking industries machine tool purchases fell below the normal range, he says.

Even the spill-over of orders from an industrially prosperous Western Europe failed to lift industry output much beyond 60 pct of normal. In 1960, metal forming and cutting orders totalled $652,400,000.

December's combined new orders reached $59,250,000, an increase of $9,300,000 over November. Foreign orders accounted for $18.4 million in cutting tools, largest foreign monthly order for the year.

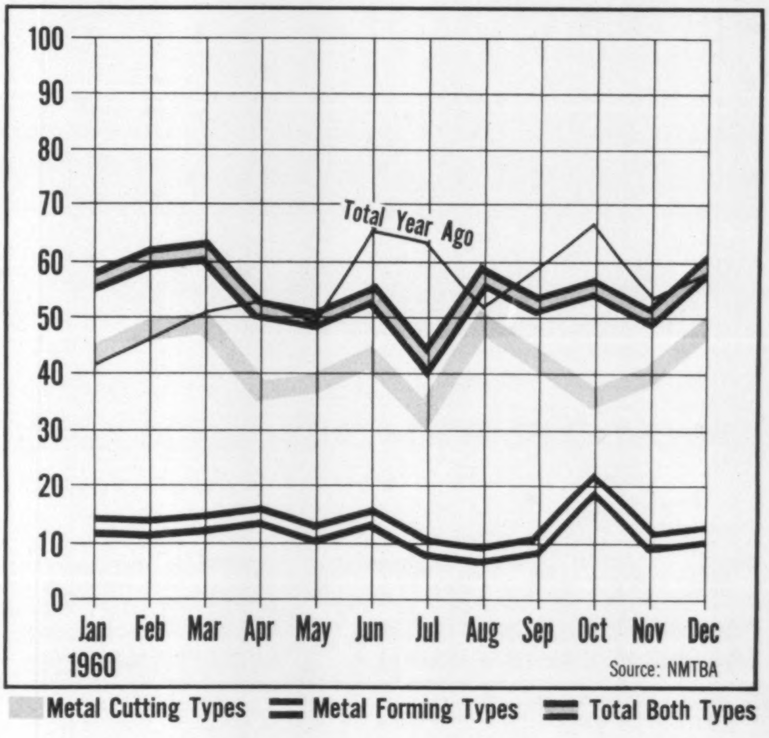
Metal cutting new orders in 1960 totaled $503,250,000, a slump from $509,000,000 in 1959. Foreign orders soared in 1960, however, reaching $113,250,000, highest point since 1952's record $122,700,000.

Mr. Geier says that most major industries now have ample production capacity; older, semi-obsolete equipment stands momentarily idle. Fully 20 pct of U. S. machine tools must be classed as outdated.

MACHINE TOOLS—NET NEW ORDERS

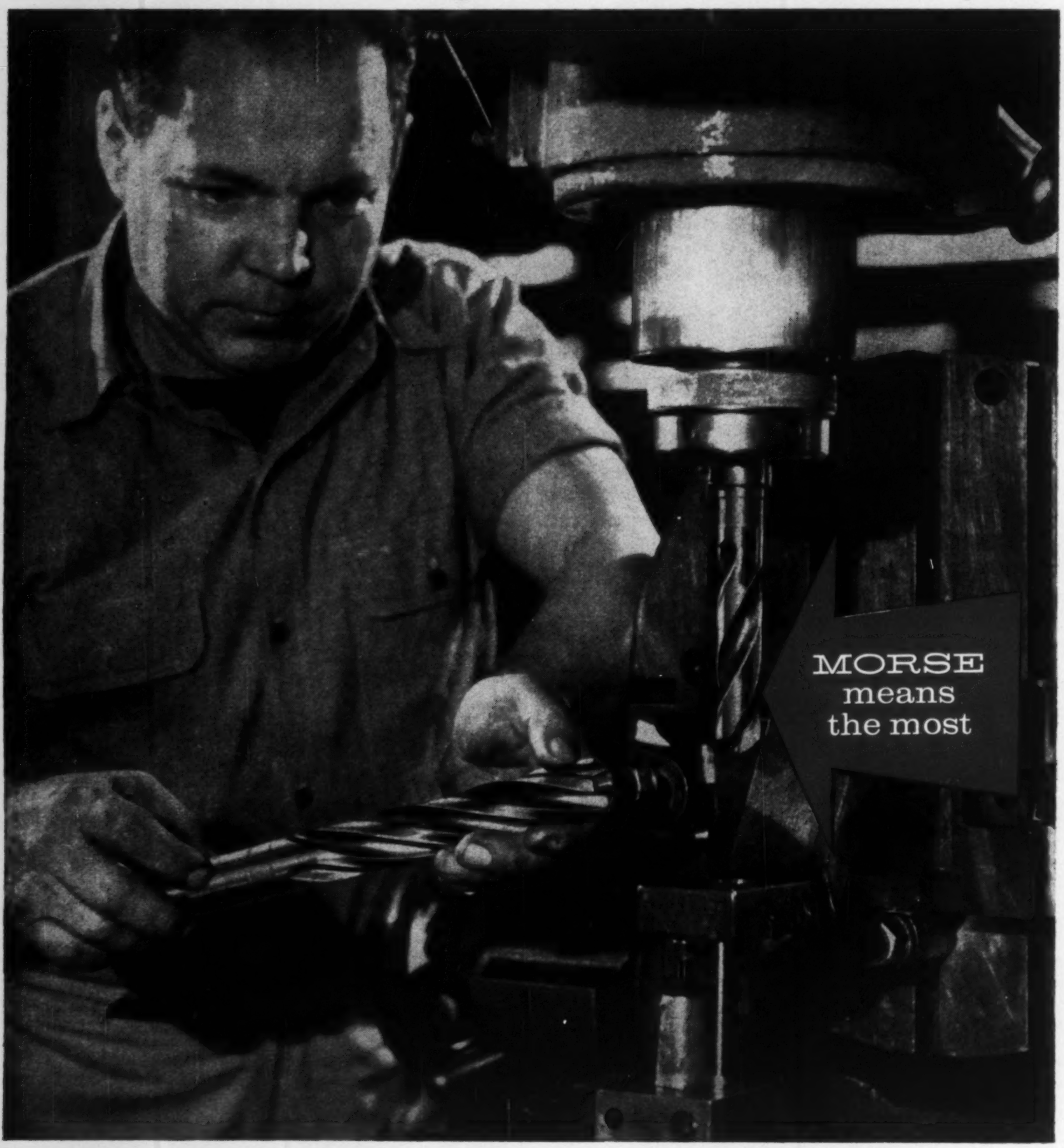
In Millions of Dollars

Metal Cutting and Forming Types



Source: NMTBA

with men who know cutting tools . . . it's MORSE everytime



MORSE means the most

TRY MORSE . . . BUY MORSE
SEE YOUR NEARBY MORSE DISTRIBUTOR

MORSE

MORSE TWIST DRILL & MACHINE CO.
NEW BEDFORD, MASSACHUSETTS

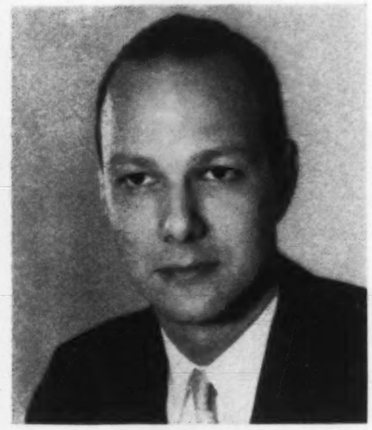
A Division of VAN NORMAN INDUSTRIES, INC.

VN

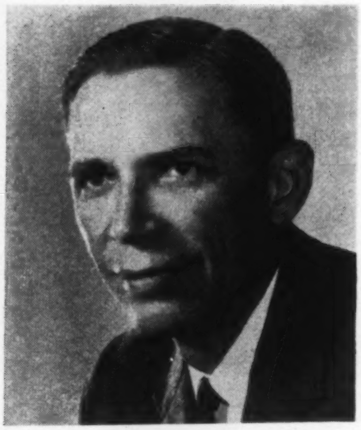
2692

WAREHOUSES IN: NEW YORK • CHICAGO • DETROIT • DALLAS • SAN FRANCISCO

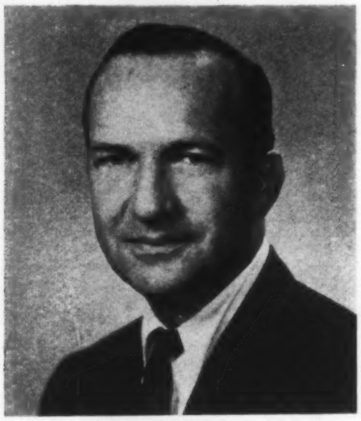
MEN IN METALWORKING



H. J. Cooper, named president and chief executive officer, Cooper Alloy Corp. He succeeds **H. A. Cooper,** who was elected chairman of the board.



John Jeppson, becomes executive vice president, Norton Co., Worcester, Mass.



Robert Cushman, named vice president and general manager, Abrasive Div., Norton Co., Worcester, Mass.

Thomas Flexible Coupling Co.—**H. B. Cummings,** elected president and **Nicholas Kay,** named senior vice president; **John Crimmins,** elected secretary, and **Edward Shuck,** treasurer; **W. B. Sawers** and **Glen Werner,** named vice presidents and **John Tellman, George Bachtel,** and **John Lardner** will serve as asst. secretaries and asst. treasurers.

Union Carbide International Co., Div. of Union Carbide Corp.—**J. E. Potts,** appointed a vice president.

Rotor Tool Co.—**H. L. Whitehouse,** named a vice president and secretary; **L. W. Dwors,** named treasurer, and **Paul Van Sittert,** named to the board of directors.

Chicago-Latrobe, Div. of United-Greenfield Corp.—**A. S. Burgoyne,** appointed vice president and general manager.

Cleaver-Brooks Co. — **P. E. Hensel,** appointed vice president, personnel administration.

Viking Copper Tube Co.—**Frank Higham,** elevated to vice president.

National Pneumatic Co., Inc.—**C. W. Coleman,** appointed executive vice president.

Southern Pipe Div., U. S. Industries, Inc.—**C. E. Lamar** and **G. C. Graham,** named vice presidents.

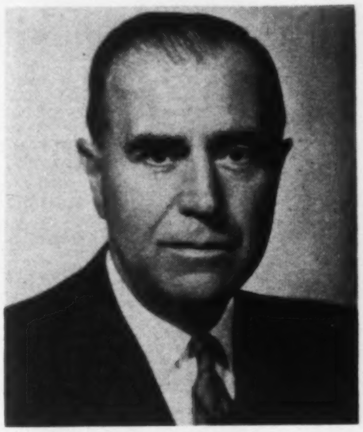
E. J. Lavino & Co. — **F. R. Dykstra,** appointed vice president; **J. J. Robinson,** vice president; **B. S. Tucker,** appointed vice president, and **H. N. Hall** to asst. vice president; **R. E. Haynes,** to asst. vice president; **A. H. Bergey** to treasurer and **J. D. Stewart** to asst. treasurer.

Allegheny Ludlum Steel Corp.—**G. C. Oehmler,** promoted to manager, export sales.

Morse Chain Co.—**H. W. Bennett,** named market manager.

Crucible Steel Co. of America—**J. W. Slattery,** appointed manager, distributor relations.

M. P. Higgins, named chairman of the board, Norton Co., Worcester, Mass.



R. F. Gow, elected president, Norton Co., Worcester, Mass.

Amsler Morton Co., Nonferrous Div. — **E. J. Bernard,** appointed manager.

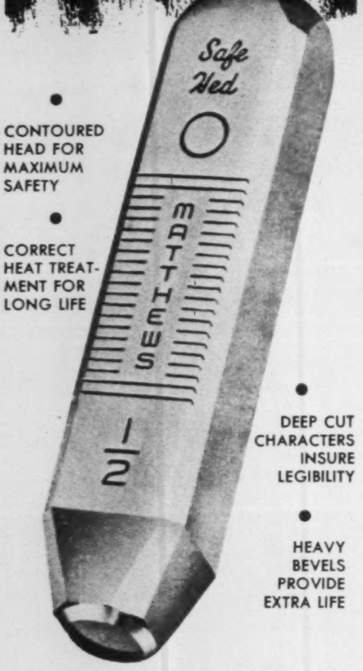
The Cleveland Metal Abrasive Co.—**J. J. Zook,** named national service manager, and **Schuyler Livingston,** regional sales engineer.

The Youngstown Sheet & Tube Co.—**J. C. Siadak,** appointed asst. superintendent, No. 2 Tin Mill, Indiana Harbor Works.

Air Reduction Sales Co.—**J. W. Cunningham,** appointed manager, Pittsburgh district sales office.

Wheeling Steel Corp. — **M. P.**

WHY
MATTHEWS
"Safe-Hed"®
STEEL STAMPS
MEET EVERY
INDUSTRIAL MARKING
REQUIREMENT


Safe Hed
MATTHEWS
1/2
CONTOURED HEAD FOR MAXIMUM SAFETY
CORRECT HEAT TREATMENT FOR LONG LIFE
DEEP CUT CHARACTERS INSURE LEGIBILITY
HEAVY BEVELS PROVIDE EXTRA LIFE

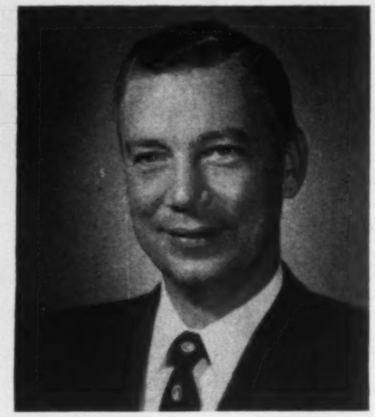
Use Matthews "Safe-Hed" stamps for all your general stamping needs. Engineer designed with proper type of steel and correct heat treatment for extra life and good marking. Available with sharp or flat face letters and figures.

Write for descriptive Bulletin 146-A20.

MATTHEWS
MARKING
PRODUCTS
JAS. H. MATTHEWS & CO.
3999 FORBES AVENUE PITTSBURGH 13, PENNA.

Apostolik, named manager, Secondary Products Sales Dept.; **Jack Mickle,** named district sales manager, Atlanta office.

Hughes Aircraft Co., Microwave Tube Div. — **R. O. Kimmel,** appointed western district sales manager.



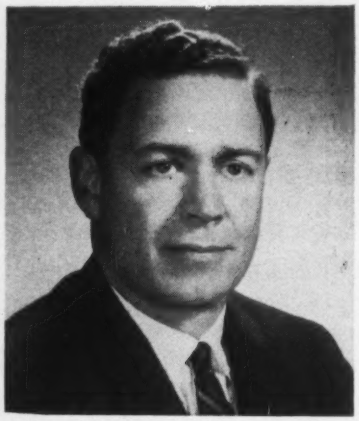
R. W. Cornell, elected executive vice president, Parker-Hannifin Corp., Cleveland.

Dravo Corp., Keystone Div. — **E. R. Hyde,** appointed asst. general manager.

United Air Lines—**W. E. Ryan,** promoted to superintendent, commercial and government sales.

Kaiser Steel Corp.—**B. E. Olsen,** appointed asst. manager, sheet and strip sales.

Crouse-Hinds Co.—**J. M. Adams,** appointed Los Angeles regional manager.



G. A. Dauphinais, elected vice president and asst. to the president, The Electric Autolite Co.

A. M. McMillan, named manager, production, Wheeling Steel Corp.

Roy C. Ingersoll Research Center, Borg-Warner Corp. — **R. W. Halberg,** appointed associated director, Automotive Dept.

Albion Malleable Iron Co.—**N. A. Birch,** appointed technical director.

Putnam Tool Co. — **William Easterly,** appointed western district manager.

Alpha Metals, Inc. — **Daniel Gray,** appointed special consultant on technical problems.

E. G. Hoehn, named asst. to the vice president, sales-administrative, Republic Steel Corp.

B-G-R Div., Associated Spring Corp.—**R. G. Hostetter,** appointed personnel manager.

Republic Steel Corp. — **L. P. Fowler,** appointed sales manager, Reclaimed Steel Div.; **B. T. Beasley,** appointed superintendent, Electrical Dept., Cleveland district steel plant; **W. C. Miller,** appointed asst. superintendent, Electrical Dept.

P. W. Coffman, appointed general superintendent, Acme Steel Co.'s Riverdale plant.

Steve Stasko, appointed chief metallurgist, Mackintosh - Hemphill Div., E. W. Bliss Co.

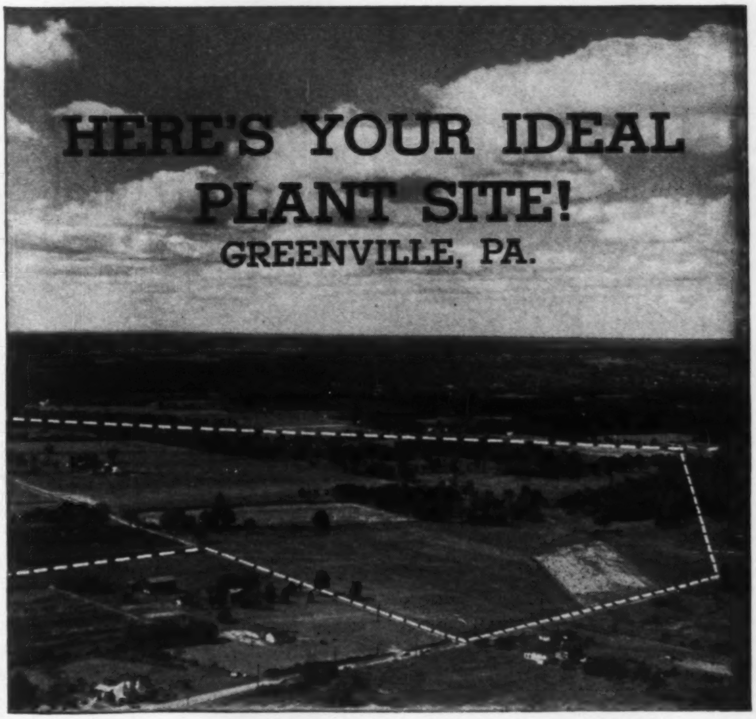
Metals and Refractories Div., Howe Sound Co.—**R. J. Metzler,** appointed assistant to the general manager.

American Steel Treating Co. — **H. C. Stone,** appointed chief metallurgist.

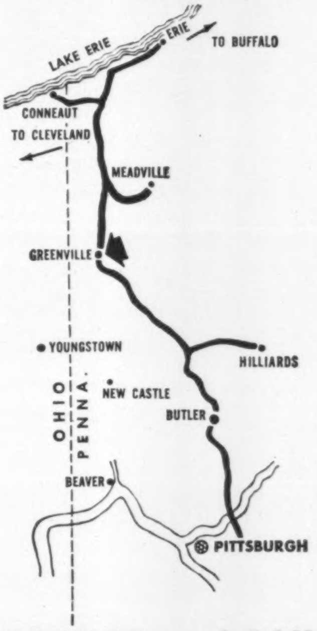
Metal & Thermit Corp.—**W. A. Hopkins,** appointed electroplating product specialist.

International Steel Co.—**R. E. Ditsler,** appointed director, marketing.

P. R. Mallory & Co., Inc.—**W. J. Topmiller,** appointed director, purchasing.


HERE'S YOUR IDEAL PLANT SITE!
GREENVILLE, PA.

Attractive, Level, Flood-Free Land Close to Metropolitan Markets of Pittsburgh, Cleveland and Buffalo


LAKE ERIE
ERIE
TO BUFFALO
CONNEAUT
TO CLEVELAND
MEADVILLE
GREENVILLE
YOUNGSTOWN
OHIO
PENNA.
NEW CASTLE
HILLIARDS
BUTLER
BEAVER
PITTSBURGH

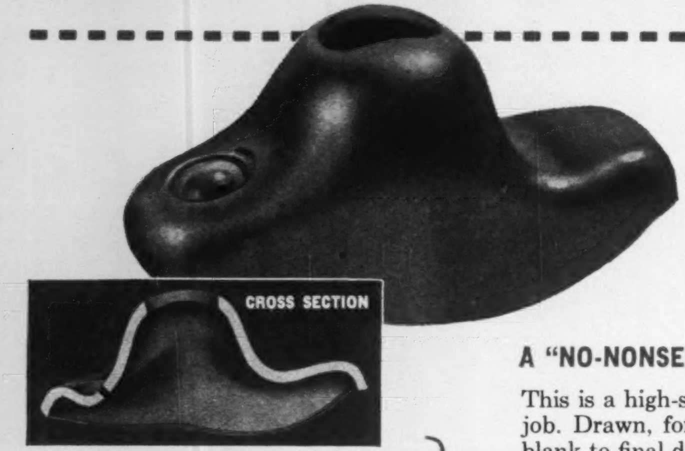
This adaptable 750 acre plant site is ideally located adjacent to Greenville, Pa., and is only 80 miles from Pittsburgh and Cleveland; only 150 miles from Buffalo. Next day rail delivery to these points.

Extensive deposits of coal, limestone, clay and aggregates nearby. Steel and other basic materials available with 24-hour delivery service.

Investigate today! Write or phone for *location factors* of this site.

BESSEMER and LAKE ERIE RAILROAD CO.
INDUSTRIAL DEVELOPMENT DEPARTMENT
1830 FRICK BUILDING • PITTSBURGH 30, PA. • ATLANTIC 1-4780
The Bessemer Man is at your "Site Service"

DSC *Accutronic*® STRIP Scores JOB-PERFORMANCE Bull's Eye on Engine Valve Rocker Arm Stamping



FACTS ABOUT THE JOB

The Part: Valve Rocker Arm—Standard in all "sixes" and "eights" used in the leading line of a big 3 car maker.

The Performance Period—1958 through 1960.

The Material—AISI 1010 Cold Rolled Steel Strip .1196″ ±.003″ x coil, drawing quality, regular satin finish (as supplied by DSC Strip Division).

Functional Requirements—Level gauge and even temper within specified tolerances to permit high speed, non-stop production; uniform chemical composition and micro structure to permit development of necessary physical properties through heat treatment.

The Operations—Blank (multiple); Multi-station progressive forming and coining dies: re-strike, pierce, heat treat.

Accutronic—A Registered Trademark descriptive of DSC Cold Rolled Sheet and Strip products.

A "NO-NONSENSE" JOB

This is a high-speed, non-stop, big run, automated stamping job. Drawn, formed, coined, re-struck and pierced from the blank to final dimensions without trim . . . then heat-treated. Production hinges upon the dimensional and metallurgical consistency of the material. This is a "No-Nonsense" kind of job.

MAN-SIZE GAUGE, TOO

It's a fact . . . most strip makers shy away from gauges as heavy as .1196″ . . . even on less complicated jobs. To DSC Stripmakers, thickness up to .187″ (sometimes heavier) is all in the day's work. At the opposite extreme, we roll down to about .010″.

NO. 1 INGREDIENT OF HIGH JOB-PERFORMANCE

Jobs like this valve rocker arm challenge the tooling and manufacturing ingenuity of the stamper, and the steelmaking skills of the supplier. The No. 1 ingredient of high job-performance, as in this case, is the way buyer and supplier understand each other's problems and work together to solve them.

DSC STRIP SERVICE MIGHT HELP YOU, TOO

Have you a stamping or roll-forming job that's made from a blank under 24″ wide . . . one that might benefit through better production and/or lower over-all cost from level gauge, even temper, job-fitted finish? Let's put our heads together. For quick action, call your nearest DSC customer "Rep" or write: Detroit Steel Corporation, Box 7508, Detroit 9, Michigan.

Customer Satisfaction—Our No. 1 Job

Performance Proved Steel The Bargain Wonder Metal

DSC® DETROIT STEEL

Flat Rolled and Wire Products

Customer "REP" Offices in Principal Cities

COPYRIGHT DETROIT STEEL CORPORATION 1961

Design Mechanical Man

A complex, 350-ton "mechanical handyman" for remote servicing of an operating nuclear reator is on order for the AEC. The bulky service machine, first of its kind, is designed to perform intricate functions from a remote location. The "handyman" will use a rotating turret, positioning arms, grapples, and similar mechanisms to install control rods, and other instrumentation.

Gets Satellite Go-Ahead

The Bell Telephone System has been given government authorization to conduct a one-year experiment in earth-satellite space communications. The go-ahead, from the Federal Communications Commission, will permit the American Telephone and Telegraph Co. to start its plan for a worldwide television and telephone system using a network of some 50 satellites.

Enters Fuel Cell Race

A good bet for space applications is a regenerative, fuel-cell system which uses lithium hydrogen, according to experts in the field. It may even develop enough energy to compete later for ground power applications. But chemical and atmospheric problems must first be solved.

Plastics Versus Metals

Plastics have recently entered a field in the aircraft industry formerly reserved exclusively for metals. At a recent plastics conference, Westinghouse engineers told of a gas turbine compressor housing made of high-temperature plastics rather than the traditional metal alloys. The impressive cost saving—about one-half—is mainly the result of greatly reduced machining.

Plan for Moon Exploration

Negotiations are under way for the building of a moon spacecraft called Surveyor. The spacecraft will be designed to land at about 10 mph. Of the 750-lb payload soft-landed on the moon, more than 200 lb will be instruments. Included will be a drill to take samples of the surface for automatic chemical analyses. TV pictures of lunar features will also be relayed to earth. Plans call for seven Surveyors to be launched by 1966.

Needed: Superalloy Cloth

How useful can cobweb-thin fibers of gold-plated tungsten and molybdenum, glass, ceramics and superalloys be for the Space Age? Air Research and Development Command scientists are searching for a replacement for nylon whose use is limited by its melting point. A fiber that can stand at least 2500°F is needed. The ARDC scientists are also considering blending fibers of nylon and cotton with the superalloys.

Can Ions Propel Rockets?

Interest is picking up for ion rocket flights into space. The National Aeronautics and Space Administration will award a $100,000 contract for the study. Ion engines using power from nuclear reactors will be the subject of the contract to be negotiated with United Aircraft.

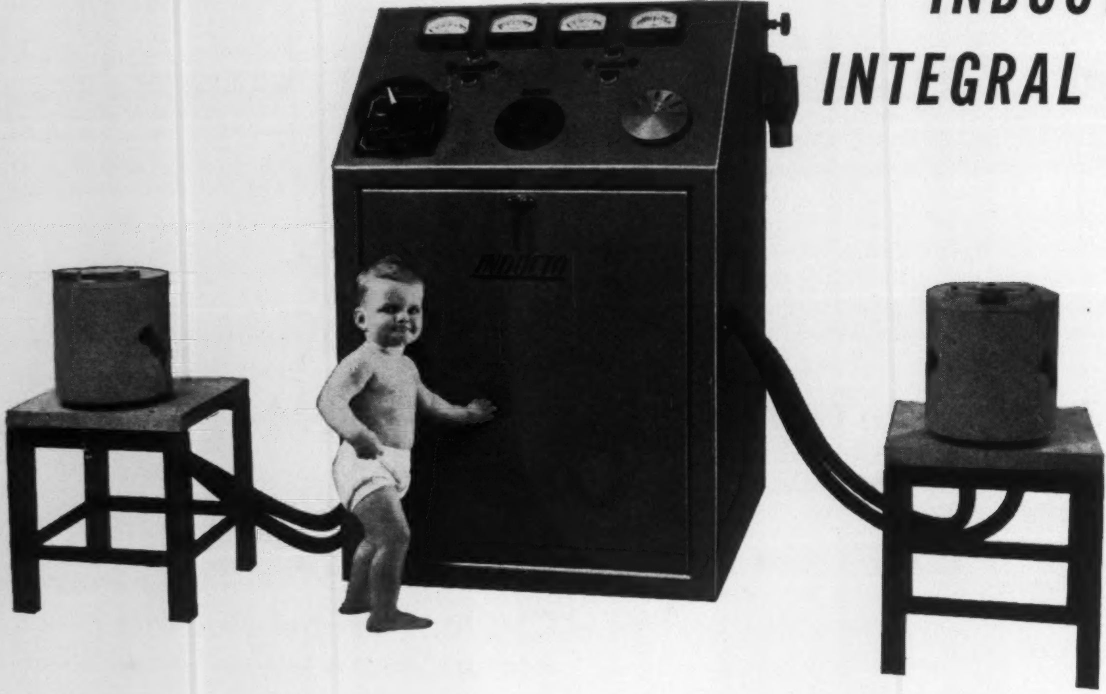
From Planes to Missiles

The downward trend in the use of conventional aircraft by the military continues. The shift in emphasis from planes to missiles is pointed up in former President Eisenhower's budget. President Kennedy is expected to continue the trend. The 1962 budget calls for 1420 new military aircraft —96 planes less than 1961 procurement.

Steel Orders Pick Up

Heavy orders for missile steels have hit one vacuum-melting shop in the last few weeks. In placing tonnage, fabricators are asking rush delivery—three to four weeks. This is taken to mean defense contractors are among those operating with little or no inventory. In this situation, any surge in defense spending would quickly be reflected in more orders for suppliers.

Meet our new baby giant . . . *the M-G Powered INDUCTO INTEGRAL 15*



. . . *you'll never again be satisfied with Spark-Gap Melters*

Inductotherm now offers the greatest space-saving, most economically-operated induction melting system in history. Once you've compared the Inducto Integral 15, you'll never be satisfied with a spark-gap converter. What's more, the 15-kilowatt Integral 15 has the same melting capacity as 20-Kw spark-gap units.

Compare Installation The entire unit occupies only 35″ x 40″ of floor space. The motor-generator, capacitors, transformers, and all controls are packaged in a single, compact console. Completely pre-assembled and pretested before delivery . . . all you do is tie-in power and water lines and you're ready to start melting. Radio shielding problems are eliminated.

Compare Operation Whatever your melting problem . . . in small foundries, in research laboratories . . . you achieve optimum power for fast, efficient melting with minimum metal loss. In addition, the Integral 15 easily maintains a balanced 3-phase load . . . you can connect two furnaces to one power control . . . and it's readily adapted for vacuum melting.

Compare Maintenance No more hydrogen to purchase, store, feed, and dispose. Moreover spark-gap converters operate at extremely high voltages with peaks up to 20,000 volts, while the Integral 15 operates at a constant 220 or 440 volt coil voltage. Safety factors increase, . . . arcing problems drop almost 99 percent. Costly mica insulation between coils is eliminated. In fact, the *only* maintenance needed is routine lubrication.

Compare Cost The Integral 15 costs a little more than spark-gap units. But you start saving money the minute you start operation . . . in time, metal, maintenance and power consumption. You can amortize the cost differential in a matter of months. And your savings are the same whether you purchase an Integral 15 outright or use Inductotherm's unique rental or lease-purchase plans.

Compare the Facts We'll gladly send you complete details on the Integral 15. Write for Bulletin 20-15. Other Inducto "Integral" models available with capacities of 30, 50, and 100 Kw. Address: Inductotherm Corporation, 412 Illinois Avenue, Delanco, New Jersey.

INDUCTOTHERM

Special Trade-In Offer

Realizing that the Integral 15 obsoletes many spark-gap units just a few years after purchase, Inductotherm plans to share this early obsolescence with their customers by offering a trade-in allowance of 50% of the original purchase price of 20 Kw Inducto spark-gap converters toward the purchase of the new Integral 15. This offer applies only to ***original*** *purchasers of 20 Kw Inducto Melters and may be withdrawn at any time.*

Sovfoto

CHIEF FIGURE: Up front in Soviet welding is B. E. Paton (right), director of the Paton Welding Institute.

What's the State of Welding Behind the Iron Curtain?

By **G. E. Claussen**—Arcrods Corp., Director of Welding Research, Sparrows Point, Md.

Welding in Russia has made steady gains. Right now, they seem to be on a par with us.

To further automation, they stress research in electroslag and submerged-arc welding.

▪ One of the targets of the current seven-year plan in the Soviet Union concerns the acceleration of welding production. It's no great surprise that the push is toward automatic techniques.

Many Americans have taken the plant tour of industry in the Communist bloc. What these men learn from their travels is also revealed in the books and magazines published by the Iron Curtain nations. As a result, Communist progress can best be interpreted through its own literature.

Where is progress being made? In welding, it is being made in Russia, East Germany, Czechoslovakia and Poland. Russia, of course, is the most active nation. The Soviet Union publishes about 40 articles on welding every month. This is twice as much as the combined total of all other Iron Curtain countries.

Neck and Neck—In Russia itself, rapid progress is evident. Nevertheless, its progress in welding is no better than ours. This is the case in all fields except one: electroslag welding.

This process enjoys wide usage throughout the Communist domain. At present, there are more than 50 installations in China, East Germany and in Czechoslovakia where electroslag welding is at work. By 1965, the Russians expect its active usage to double.

News of Soviet progress emanates from several sources. These include welding institutes and the labs in colleges and plants specifically devoted to welding research. One of the most important research centers is the famous Paton Welding Institute in Kiev. This is the place where electroslag welding is put through its paces.

To Each Its Own—There are many other research centers in the USSR; each one has its own specialty. Paton's scope includes both automatic arc and resistance welding. The welding lab of the Moscow Metallurgical Institute, on the other hand, conducts basic research on sources and distribution of heat in welding.

Moscow's Vniavtogen lab explores the areas of gas welding and cutting. Vniieso in Leningrad builds equipment for arc and resistance welding. In Russia alone, there are probably a dozen other major laboratories devoted solely to studies in welding.

One of the best equipped welding laboratories in the world is in Czechoslovakia. It's the Bratislava Institute. Founded in 1949, this center now carries about 100 technical workers on its staff. The Institute develops covered electrodes, power supplies and apparatus for automatic arc and resistance welding. Its electroslag equipment is widely used throughout the world.

Main Aims—The electroslag process is intended to displace forgings and castings. It combines several advantages. First of all, it operates in the vertical position, thus conserving floor space. It also has a very high deposition rate. Expressed in terms of pounds per hour per 100 amperes, the electroslag method is at least twice as fast as other arcwelding techniques.

The equipment is a bit complex, but it can handle section thicknesses from 1½ in. to 10 ft economically. The electroslag principle is also being applied to the remelting of metals to lower the metalloid content.

Details of the process have been supplied freely, including flux and electrode compositions. The Russians are having their troubles, though. They appear to be slow in coming to grips with the brittleness of the coarse-grained structures in the weld metal. Another problem is the extent of heat-affected zones.

Where It's Used—In what ways is electroslag welding serving Soviet industry? It's used to produce forging presses, power and chemical equipment, to build parts for electrical machines, and in ship-building. Most electroslag welding is performed on steels of structural and low-alloy grade.

Some builders are using the method to erect blast furnace blocks and large cement plants.

Due to the process, one machine builder is now turning out an added 1500 tons of equipment. Here are a few of the savings at the same plant: 1,150,000 rubles in forged and welded parts; 400,000 rubles in cast and welded parts; and two million rubles in rolled and welded parts.

Into the Field—The process has even moved outdoors. Parts up to 0.197 in. thick are being electroslag welded for blast furnace shells. This changeover from manual welding has increased efficiency by 500 pct.

According to Russian literature, submerged-arc welding is second in prominence. A single book on the subject lists as many as 50 fluxes which are available to industry. Fused, agglomerated and bonded fluxes are included.

The Paton Institute has developed submerged-arc equipment to weld plate girders. This system features three electrodes in line. It welds two joints in ½-in. structural steel plate at 95 ipm.

The lead electrode uses 1400 amp, while the two trailing electrodes take 1100 amp. The first electrode is 4 in. ahead of the next one. The second electrode is 1 in. ahead of the third.

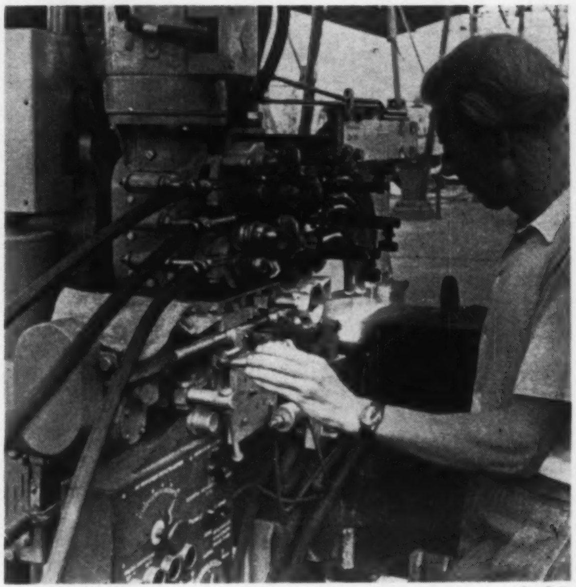
Another Nation — The Central Welding Institute in East Germany

Electroslag Welding Saves Time and Cost

Part	Fabricating method	Weight of part, tons	Ingot required, tons	Labor, man hr	Length of cycle, days	Cost savings, pct
Turbine shaft	**Forged**	**60**	**103.8**	**1195**	**50.6**	**38**
	Welded	**35.6**	**57.9**	**1111**	**29.4**	
Hydraulic press cylinder	**Forged**	**118**	**190**	**2671**	**110.6**	
	Welded	**109**	**180**	**2594**	**75.6**	**8**
Hydraulic press frame	**Cast**	**124**	**208.5**	**13,431**	**96**	
	Cast and welded	**124**	**182.3**	**11,234**	**71**	**20**
4000-ton press frame	**Cast**	**114**	**148.5**	**12,930**	**113.7**	
	Welded	**92**	**133.8**	**7757**	**66.3**	**34**
Shear frame	**Cast**	**31.7**	**43.7**	**4105**	**55.5**	
	Welded	**25.1**	**34.5**	**3046**	**39.5**	**30**

Eastfoto

CZECH ADVANCE: Winner of the Grand Prix at the Brussels World's Fair is this welding press. The unit was built by Czechoslovakia's Britislava Institute.



Sovfoto

ELECTROSLAG IN ACTION: Paton Institute's Model A-372-R electroslag welding machine can handle metal thicknesses ranging from 0.5515 in. to 17.33 in.

has come up with a two-electrode process where layers of stainless weld metal are applied to a mild steel surface. In this setup, the vertical trailing electrode carries most of the current. The lead electrode only carries about 50 amp.

The lead electrode is angled at 30° to the plate. When straight polarity is used, only about 8-25 pct mild steel is fused into the stainless deposit.

Pipe Welds — Here are a few production examples of submerged-arc welding throughout Soviet industry. The Kursk Repair Shops uses the process to make spiral, lap-welded joints in 0.059-in. steel pipe.

At the Zhdanov Heavy Machinery Works, they weld 1750 cu ft capacity railway tank cars. Here, longitudinal and girth seams are welded on ⅜-in. plate.

Submerged-arc welding is also used at the Chelyabinsk Tractor Works where box sections are joined together. These sections consist of a channel with a strip welded to the two legs. Welding is done in a jig using two heads. Both channel legs and plate are about ½ in. thick.

Electroslag welding is the most popular subject of the Russian engineers. The scope of interest extends into many other fields, however. Papers written by members of the Paton Institute, for instance, delve into the cybernetics of welding control systems and the relationship of geometric similarity to the programming of spot welds.

Other subjects from Russia include temperature distribution, residual stresses, fatigue strength and hot cracking.

Now and then, you hear about some new welding novelty. Steam welding and vibro-arc welding are two examples.

Little Interest — Gas-shielded metal arcwelding receives little attention in the Soviet press, even though much has been done to develop CO_2 welding machines for piping. During the past year, about 1000 semiautomatic CO_2 units have been made for Soviet industry.

Covered electrodes are not a strong point in Russia. The main reason seems to be that their manufacture is not centralized. Instead, it's spread among plants operated by the fabricators themselves.

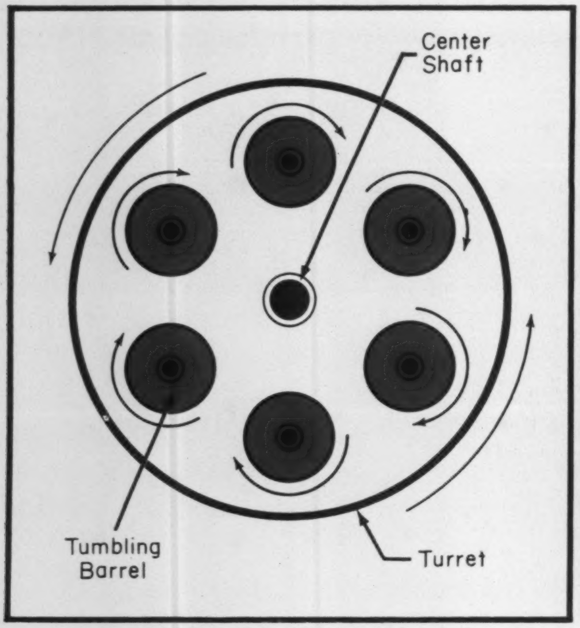
Heat and Pressure—One test setup has been devised to butt weld ⅜-in. wall gas pipes by striking an arc between the edges to be welded. A transverse magnetic field causes the arc to move rapidly around the pipe. As soon as the edges reach the forge welding temperature, the pipes are pushed together.

In East Germany, a phenomenal amount of welding is done by the submerged-arc process. This condition can be traced to a severe scarcity of labor. In fact, the labor supply is expected to remain scarce.

The East Germans have done something to combat porosity due to rust. They have mixed carbon in a reactive form with the submerged-arc flux to combine with hydrogen. Another researcher has succeeded in inserting impulses of high current into power supplies. The effect is an improvement in performance of covered electrodes.

Reprints of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 143.**



COUNTER MOTION: The barrels revolve in a clockwise direction while the turret goes the other way.

WET TUMBLING: Centrifugal force is used in wet tumbling, too. Here, barrel speeds can be regulated.

Centrifugal Force Adds Luster To Barrel Tumbled Parts

Two new tumbling machines, one dry and the other wet, both incorporate centrifugal force in their cycles.

Extremely bright results are obtained in little time.

By **R. R. Irving**

▪ The next time you're out in the shop, try this little experiment. Pick up some part that hasn't been finished. Then dip your forefinger into dry abrasive powder. To complete the first half of the experiment, apply some of the abrasive on the surface of the part. Then wipe it off and note the degree of brightness on the surface.

Follow the same procedure again, only this time exert a little pressure with your forefinger as you apply the same abrasive. After you wipe the surface clean, you'll see that the second procedure resulted in a far brighter surface. The difference was pressure.

In barrel tumbling a variety of metal parts, suppose you introduce pressure into the cycle. Instead of an individual part weighing its usual eight ounces, applied pressure would increase part weight to 20 lb. Pressure would introduce a super-clean brightness. And this can be done despite the intricacy of the part shape.

Force a Factor—The secret of such success is centrifugal force built right into the barrel finishing cycle. This feature is included in a machine made by Harper Buffing Machine Co., East Hampton, Conn.

The machine is called the Harperizer. It contains six barrels which remain on the machine. The barrels can be loaded and unloaded without removing them from the main unit.

The turret rotates in a counterclockwise direction at 270 rpm, but the individual barrels move in the opposite direction at only 80 rpm. The barrels are all lined with neoprene to keep the parts from abrading.

According to J. F. Harper, president of the company, automatic buffing is still the better process provided that your parts have smooth contours. However, an intricate shape is a natural for the Harperizer.

Speedy Cycle—As soon as a suitable soft abrasive plus parts have been inserted in the machine, tumbling begins. A true buff finish is obtained in 10 minutes or less. The parts are buffed evenly. Threaded parts remain intact.

Parts are placed on a tray. The dimensions of the tray are exactly the same as the dimensions of the bin in the barrel itself. After the cycle has been completed, the parts are dumped onto a screen under the machine. Abrasive media fall through the screen and are immediately sucked back into the hopper, ready for re-use.

The abrasives will hold up for at least 50 hours of operation.

How many parts will the Harperizer hold at a time? If the parts are small and smoothly shaped, it will take up to 500 or even 600. More intricate shapes reduce the number of pieces to about 144.

Loading Time—A typical run takes about 3 to 10 minutes to complete. Add to this the time needed to load and unload the machine: another 5 to 10 minutes. That means that you can finish three or four loads within an hour's time.

The company has nearly 50 machines in the field. Metal finishes handled to date include steel, aluminum, zinc diecastings and plated wear (nickel-silver and sterling.)

The automotive industry is using the Harperizer to finish mirror brackets, diecast trims, bumper guards and bearings along with their inner and outer races. Sewing machine needles can also be finished, in bulk quantities, too.

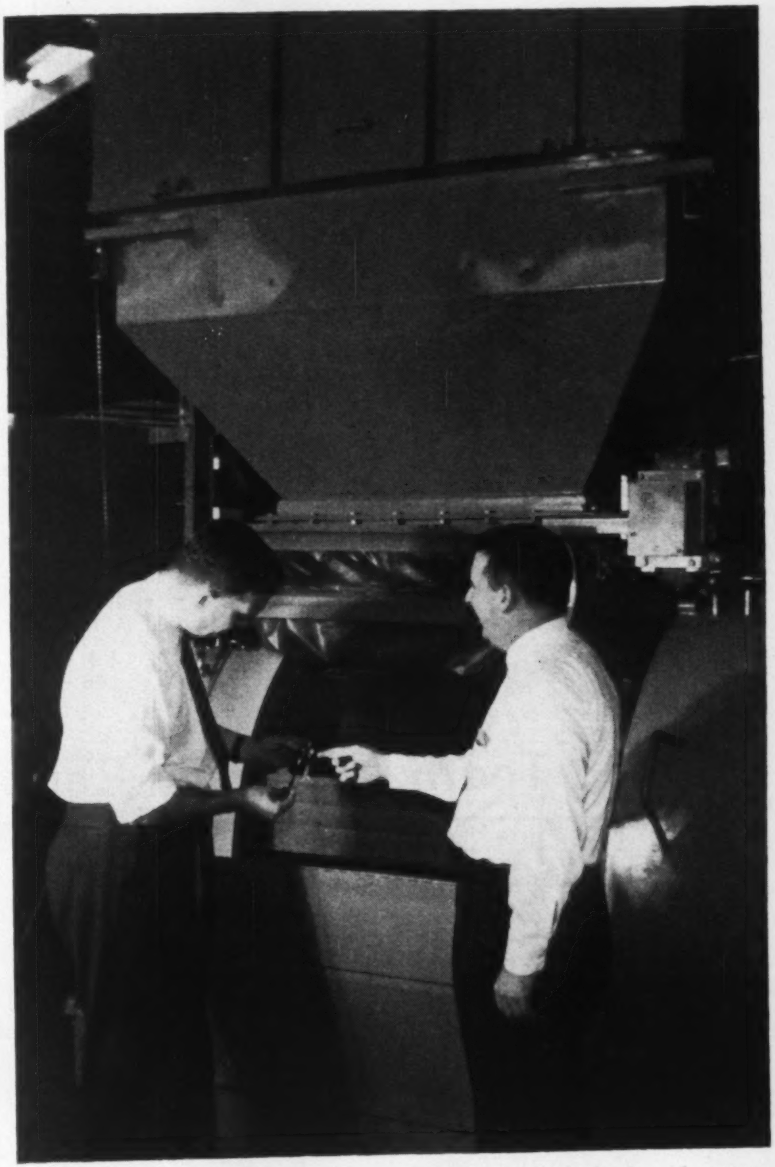
Deburring Unit—Aside from the Harperizer, a dry tumbling machine, the company has also perfected a wet tumbling unit to do deburring jobs. The latter unit uses hard abrasives such as stone or ceramic chips. Unlike the dry machine, the deburring unit has removable barrels.

Wet tumbling can be compared more closely with normal barrel tumbling, except that once again centrifugal force is used. However, the presence of force shaves 59 seconds from every minute of normal tumbling time.

The wet tumbler has four barrels. In size, they are 18 in. deep, with an 11-in. ID. Turret speed can be varied from 3 to 70 rpm. The barrels rotate from 0 to 200 rpm. If needed, the barrels can be designed into custom shapes. They can even be separated into individual bins if needed, just like the dry tumbler.

Large Lots—The deburring machine can also finish heavy productions of small parts, like watch parts, electronic components, motor laminations, fishing guides, needles and surgical instruments. This unit completes its cycle within 3 to 30 minutes.

Where milling used to be done, the Harperizer is now used to improve surface finishes. Milling used to bring the surface down to 40 rms. The Harperizer, in 5 minutes, has reduced the surface by 15 rms. In 10 minutes, it reduced it to 5 rms. This work was done on a precise cam for control of fuel in jet engines.



WITH HIGH HONORS: The Harperizer gives intricately-shaped parts a fine, buff finish. The cycle takes 3-10 minutes to complete.

How to Repair Broken Gears

By Federico Strasser—Consultant, Santiago, Chile

What do you do when a gear tooth or rim fails in the middle of a big production run?

If a spare gear isn't available, there's only one answer. You must repair the damage.

▪ Gear teeth always seem to break at the worst possible time. Failure often occurs in the middle of a big production run. When a gear on an important piece of machinery fails, you frantically search your stockroom for a replacement.

If you're lucky, a spare gear is on hand. If it's not your lucky day, you've got to find a way to get the machine back in operation.

Quick delivery of a new gear may be the answer. But how quick is quick? Even a matter of days can throw a tight production schedule out of mesh. Very often, temporary repairs are the only answer to such a situation.

Wide Choice — There are many ways to repair broken gear teeth. All of these repair methods should be considered temporary solutions, until proper replacement is effected. Permanent repairs are possible in a few cases—if the gears handle light loads.

Your choice of a stopgap method depends upon several factors. These include: the type of gear; the material from which it's made; and the stress buildups which the gear teeth have to withstand.

The main factor in deciding how to make repairs centers on the extent and the type of damage. Some teeth break cleanly. They snap off without deforming the rim or crushing the broken teeth.

Other gear teeth are badly deformed or shattered when they fail. In extreme cases, a section of the gear rim rips out with the teeth, as failure occurs.

Back in Place — Let's consider simple repairs first. The simplest problem occurs when a tooth breaks off in one piece, without any other deformation. When this happens, a broken tooth can be fastened in its old position.

Use one or more screws to secure the broken tooth to the gear. If side clearance is tight, pass the screws down through the tooth and thread them into the gear's rim. Countersink the top of the broken tooth so that the screw heads don't protrude.

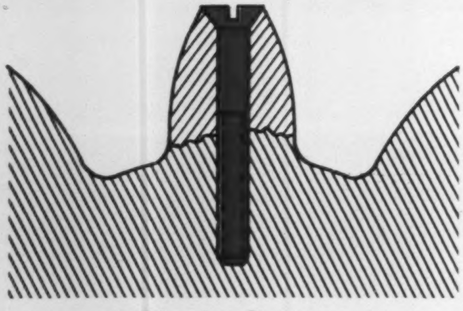
If clearance allows, an alternate method can be used to replace a broken tooth. Two thin plates, with upper profiles shaped like the gear tooth, should be fastened to each side of the tooth. Then, slide this assembly into place with the broken tooth in its old position.

Use several screws on each side of the gear's rim to secure the assembly. If the broken tooth is wide, countersunk screws can also be fastened down through the tooth as previously described.

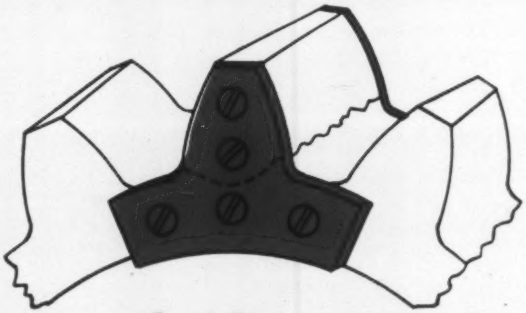
Construct False Tooth — Now, we'll consider a more complex repair problem. Sometimes a tooth breaks into two or more pieces. If the tooth can't be rescued, a new one must be made.

The easiest way to make a new tooth, for a gear with a rim that's wider than the tooth, centers on the use of a threaded plug or bolt. First, machine off the ragged portion of the broken tooth. This provides a flat surface on the rim below the pitch line. Drill and tap in this flat area.

Sheared Teeth Are Easily Repositioned

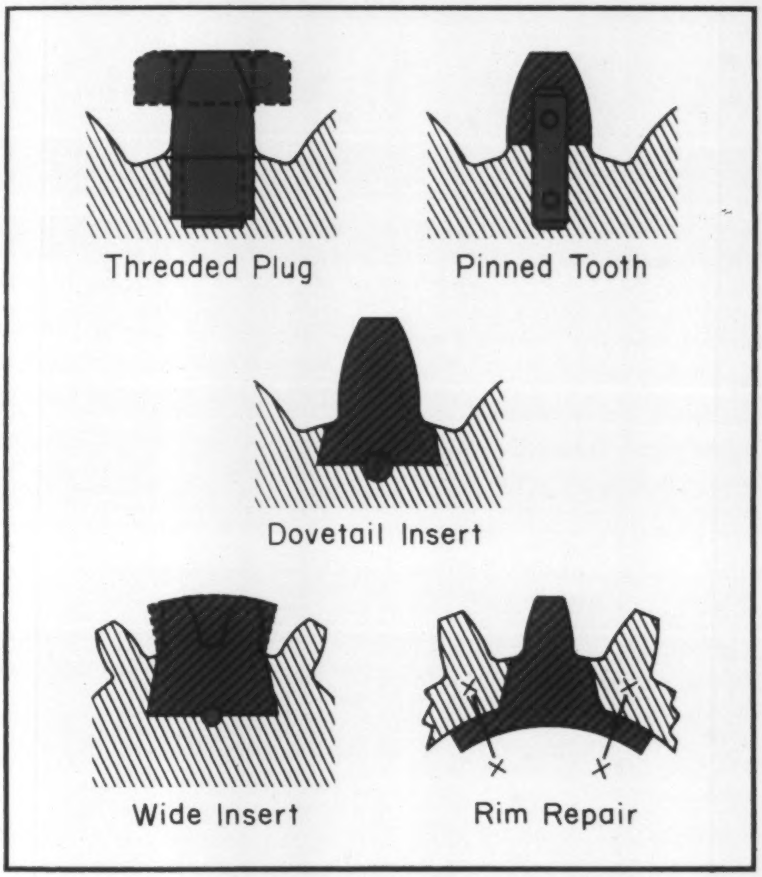


Single Screw



Dual Plates

Construct New Gear Sections



Thread the plug into the tapped hole; then shape the plug so that it matches the rest of the teeth and meshes properly. Hand filing or milling can be employed to shape the plug.

The plug's diameter should be greater than the tooth's width. If not, you won't obtain a full tooth. For best results, drill a blind hole and thread the plug all the way to the bottom of the hole.

Before inserting the plug, place a little acid on the threads. This helps to prevent loosening. A set screw in the side of the rim can also serve to lock the plug in place.

Thin-Rim Repair—The full-plug method is recommended for gears or sprockets with wide rims. It isn't suitable when the missing tooth is about the same width as the rim.

False teeth can be made for gears with thinner rims. In fact, these false gear teeth solve repair problems on both thin- and thick-rim gears.

There are several ways to make and fasten a false gear tooth. A new tooth, shaped to size from the same material as the gear, can be fitted with studs or dowel pins. After drilling the rim, insert the pinned tooth by tapping it into place with a soft hammer. Use set screws to lock the pins within the tooth and the rim.

You can insure stronger repairs by using a dovetailed false tooth. Refer to the last illustration for general dovetail shapes. This type of false tooth hinges upon a press fit in a groove that's machined in the gear's rim.

Set screws lock the dovetailed insert in place on large gears. For small gears, welding, brazing or soldering prevents slippage.

Double Trouble — The dovetail method offers a good solution whenever two adjacent teeth are missing. In such a case, the insert occupies twice the width of a single dovetailed tooth.

If a gear rim is damaged, repair becomes a really tough problem. You've got to machine away part of the rim in order to get a straight or tapered-wall slot. After you've prepared the slot, fill the gap with a new matching insert.

The insert may be cast, forged or machined. If possible, it should be the same material as the gear.

To fasten the insert to the gear, use screws, dowel pins, rivets or welds. Make your fastener choice in accordance with gear size and load requirements.

Deposit Weldment — Sometimes, you can replace a broken tooth by building up the "lost" area with a bronze weldment. This consists of depositing the bronze in a series of ripples on the rim at the site of the missing tooth. This buildup is then machined to desired shape and size.

The strength of a bronze-weld tooth often exceeds that of the parent metal. Some people consider this type of repair permanent.

Now, let's evaluate one of the easiest repair methods. This method can only be used to repair gears which are built up from thin stampings.

Repair is effected by taking the gear apart and rearranging it so that the missing tooth becomes distributed uniformly all around the gear's periphery.

Of course, gear strength is impaired by redistributing the broken-blank area. However, this quick repair gets the gear back in service on a temporary basis.

Reprints of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 144.**

Rock-Forging "Irons" Welds To Give Quality Tubing

By **J. A. Seme**—Chief Engineer, Swepco Tube Corp., Clifton, N. J.

One unique aspect of this process is the conversion of a welded tube into a product that is virtually seamless.

There are a number of other advantages. Included are improved properties at lower cost.

▪ Going hand in hand with today's trend in higher pressures and temperatures is the need for tough tubular products.

Temperatures up to 2000°F with a constant internal pressure are not uncommon. Oil refineries, chemical plants, central-station steam systems, for example, operate in this environment.

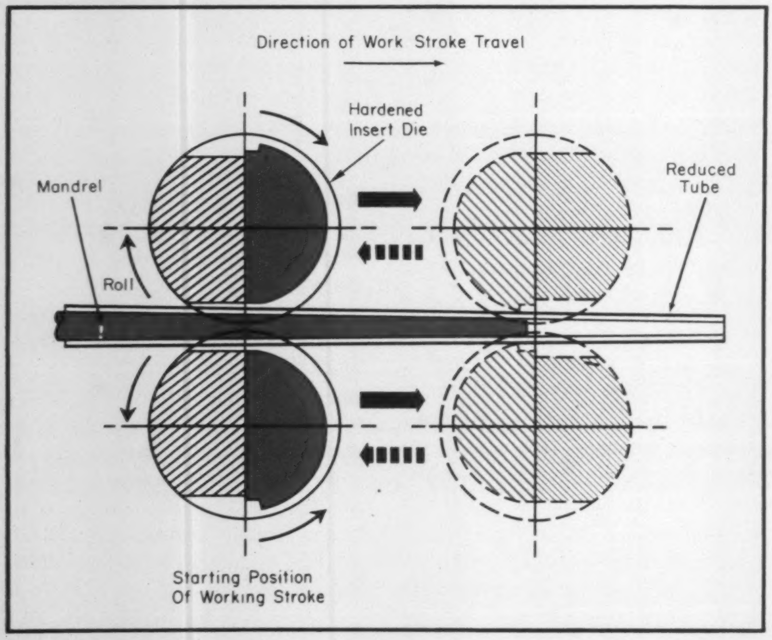
Shortens Life Span—What happens, though, is that tubes creep or flow under these conditions. Tube life becomes a problem.

Taking up this challenge is a new type of tubing from Swepco Tube Corp. Swepco classifies this tube or pipe as full-finish rock-forged (grade FFR). It's also known as Rockrite.

This is not a welded tube or pipe. Although it is originally welded, it becomes seamless after cold reducing 40-50 pct. The welded area takes on a wrought structure. Final properties are much improved over the original condition.

To obtain this higher quality, a balanced chemical analysis and proper grain size are musts. They are vital to the performance of the tubing. To accomplish this, special heats were made through the cooperation of the Jessop Steel Co., Washington, Pa.

Rocking Motion Shapes Tubing


Direction of Work Stroke Travel
Hardened Insert Die
Mandrel
Reduced Tube
Roll
Starting Position Of Working Stroke

How's it Made? — Rock-forged pipe is made from wrought plate which is formed into a tube round or hollow billet. Automatic welding follows cleaning with a standard cleaning solution. The round or billet is then annealed, relieving stresses of cold work.

Swepco's rock-forging technique does not cold-draw tubing. Instead, it compression-forms the stock by rocking over an internal mandrel.

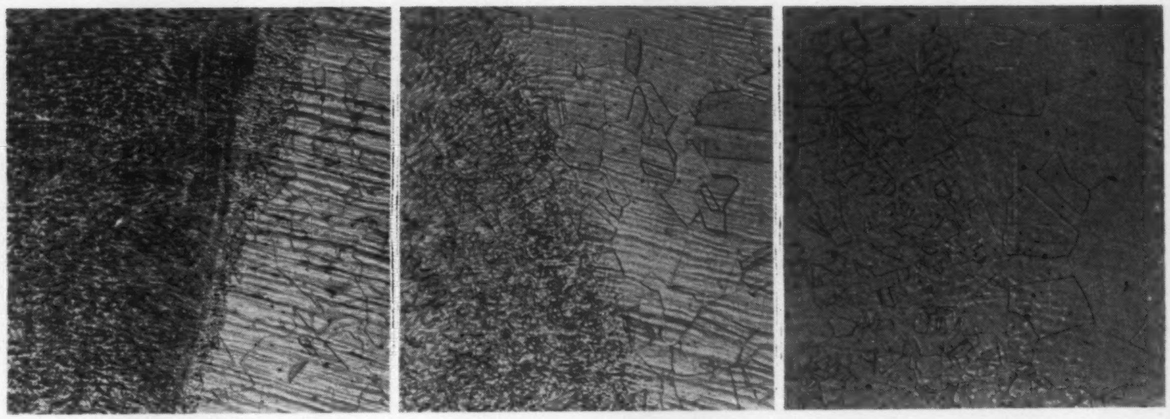
These rocking-cam dies are semicircular in shape. Each has a tapered groove which straddles the tube round. The dies rock back and forth as the tube round rotates simultaneously. In time, they cold-reduce the original diameter of the round some 25 pct, and the original wall thickness about 50 pct.

Doubles in Length—As the tube round passes through the rocking dies, it doubles its original length. The polished, tapered mandrel controls the inside diameter; the cam dies control the outer diameter.

In addition to outer diameter tolerances of ±0.025 in., rocking maintains a uniform wall thickness throughout the full length of the pipe or tube. Deviation from straightness, measured by a feeler gage on a surface plate, will not exceed ⅛ in. in 10 ft.

Any Restrictions?—Many metals adapt to the rock-forging process. Tubular parts can be furnished, for example, in AISI 4130, most austenitic stainless steels, high-nickel alloys, and zirconium alloys.

There's a full-size range from



STEP BY STEP: Weld half of joint loses cast structure (left) after preliminary step; some grains appear (center). Note complete recrystallization (right) after rock forging and final annealing.

2½-12 in. IPS in schedules 40 and 80. Lengths go up to 20 ft.

In addition to precision-round tubing, rock-forging can make tubes with continuous or step tapers. The former has a taper running through all or a portion of the length. The latter has a series of tapers spaced at intervals.

Take Your Pick—If need be, you can get internal bores other than round. Bores are available in square, triangular or hexagonal shapes.

Uses for rock-forged products are many and varied. Heating coils, shafts and sleeves, piston cylinders, and furnace roller are just some of the applications.

The atomic-space age provides other outlets. Rock-forged tubes and pipes are used in nuclear submarines, nuclear power plants, and rocket-motor bodies.

Checks Physicals — The graph shows results of tensile tests comparing seamless tubing and welded tubing that has been rock-forged. The metal is T-304 stainless.

Note that the rock-forged tubing has higher physicals over a range of temperatures. Elongation of the rock-forged tube averages 48 pct at room temperature.

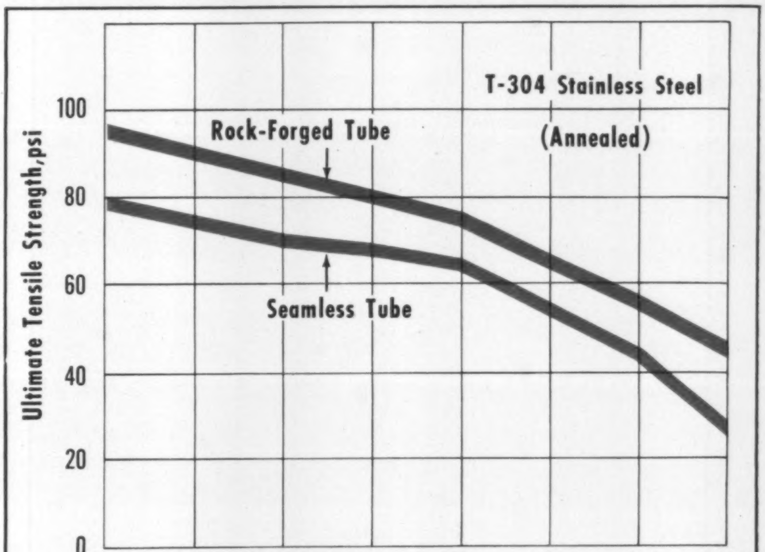
What happens to a welded tube during rock-forging? The first photo-micrograph is of the original weld joint. The cast structure of the weld distinguishes it from the equiaxed grains of the parent metal.

Alters Structure—Cold reducing about 6 pct and solution annealing produce the structure shown in the second micrograph. The cast structure is still seen but to a lesser degree. The weld has recrystallized somewhat.

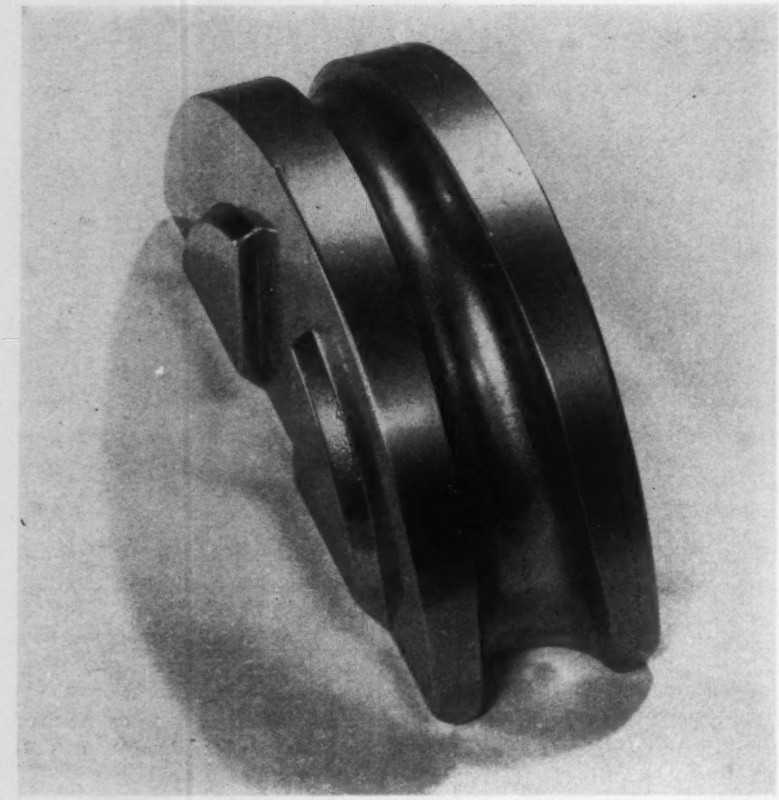
Next comes cold reduction of 40-50 pct and full annealing. The weld takes on the structure shown in the last micrograph. Note that the cast structure has completely recrystallized into definite grains.

To determine the quality of both inner and outer weld faces, 180°-bend tests were made in an ASTM guided jig. Dye checking revealed no fractures or fissures at 10X magnification.

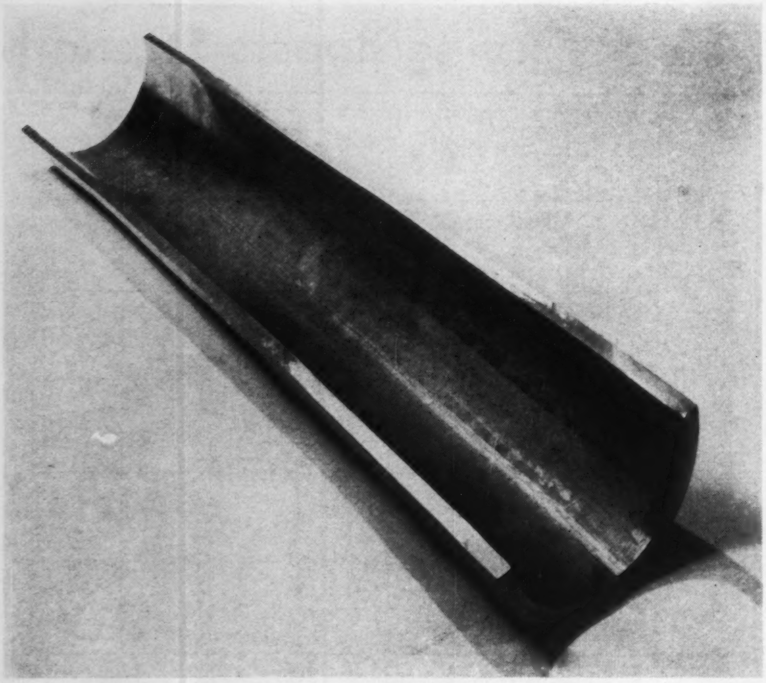
Full-flattening bend tests were also made. Pressure applied in opposite directions flattened the specimen until it could no longer be



Rock-Forging Boosts Strength



CRADLES AND ROCKS: Tapered groove in semi-circular cam die straddles the tube round. Rocking to and fro cold reduces tube to desired size.



TAPERED SECTION: Features of rock-forging are evident: Improved finish at reduced end; gradual ironing out of weld along tube length.

distorted. Again, no fracture or fissure appeared after dye checking.

Take Look at Profile—How does surface finish react to rock forging? Comparative profilometer tests were made on Type 304 stainless tubing. A seamless tube had a reading of ASA 63. A welded tube that had been rock-forged has an improved finish—ASA 32.

Stainless steel is one candidate for cryogenic applications. Impact tests show that rock-forged pipe and tube will hold up at —320°F. Readings taken from the weld, adjacent area, and parent metal are 47-49 ft lb—well above the required 15 ft lb.

Tests for Corrosion—Putting a stamp of approval on rock-forged products calls for other checks on quality. The copper sulphate and Huey tests, for example, check on the tubing's corrosion resistance.

After boiling in copper sulphate for 72 hours, tubing was bent 180° in an ASTM guided jig. Test radius is ½ in. No openings, fissures, or general deterioration were noted in any surface.

Corrosion loss was 0.00036 in. per month under Huey-acid-test conditions, well below the maximum permissible rate of 0.0015 in. per month.

Bursts Tell Story — Another dramatic test points up the value of the improved properties of rock-forged tubing. Comparative burst tests were made between an annealed, rock-forged pipe and a seamless pipe of like size and wall thickness. Result: Average burst pressure of the rock-forged pipe was 30 pct higher.

The ability to pass all these tests —bending, tensile, impact, corrosion—partly explains the popularity of rock-forged products for so many applications.

Not to be overlooked is one highly significant factor—cost. Rock-forged pipe and tubing cost about 5-15 pct less than similar sizes and alloys of seamless tubing.

Cutter Mill Speeds Piston Flow

Precision Balancer Trims Parts to Slim Tolerances

Precision balancing can be a speedy operation if you have the proper unit.

American Motors Corp. more than doubled its piston output with a new, fully-automatic machine.

▪ If you produce parts that require balancing, you're probably interested in ways to step up production. Balancing jobs are usually a cog in the works, but they can be done quickly with the proper machine.

At American Motors Corp., piston balancing soared from 195 parts per hour up to 510 pistons per hour with the use of an automatic machine.

The unit automatically weighs the aluminum pistons. It then removes metal, when necessary, to bring the weight range within ±2 g. Such precision is a must to insure perfect engine balance and smooth operation.

The pistons are permanent mold castings. Trim pads are designed into the castings for weight control. The two pads are located one on each side and adjacent to the open end of the piston skirt.

How Unit Works — The pistons pass through a mechanism which checks whether the part is in the proper position to be received by the machine. If, by accident, the part is inverted when fed into the chute, a test finger strikes the piston head. The linkage controlled by the finger locks the piston in place until it's removed.

The pistons then feed by gravity along the chute to a scale. An advancing mechanism allows the foremost piston to move to the scale and arrests those that follow.

As the piston rests in the scale's pan, its weight is recorded by the position of the scale beam. The position of the beam determines the depth of cut to be made by the milling cutter.

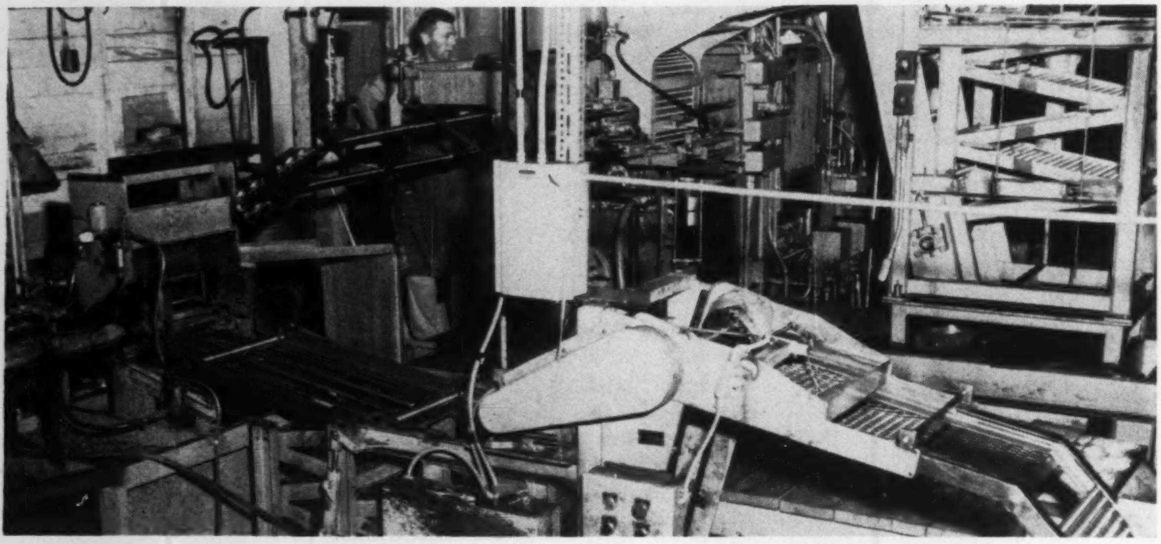
Milled to Weight—The piston is then raised to the cutting station by a transfer arm. There a power chuck holds the piston in place while the cutter advances internally along the piston's axis.

The cutters trim the pads to the predetermined setting of the scale beam. This brings the piston's weight to the design limit of 427 ± 2 g. The chips are removed by means of a suction chute.

After trimming, the cutter retracts from the piston. The piston is then pushed to a discharge point automatically. One part is always being weighed, while another is being cut.

The unit, made by The Morris Machine Co., Cincinnati, balances pistons at the rate of one every six seconds. This is its maximum efficiency.

FAST SERVICE: Pistons are balanced at the rate of one every six seconds. The automated unit rejects grossly overweight pistons, then processes those acceptable to obtain a finished weight of 427 ± 2 g.



BURR-FREE TUBES: An air jet and a pneumatic pusher rod remove all chips from the tube bores.

Integrated Tools Shape Shafts

Conveyors Reduce Handling in Hollow-Shaft Production

By **H. E. Benn**—Tool Engineer, St. Joseph Div., Whirlpool Corp., St. Joseph, Mich.

Mechanization helps to transform tube stock into burr-free drive shafts for home washers.

These complex shafts boast 30-microinch rms finishes.

▪ Basket-drive tubes serve a vital role in automatic home-laundry washing machines. In fact, washer performance hinges on these complex hollow-shaft tubes.

At one of Whirlpool's St. Joseph plants, a mechanized-handling line speeds production of these drive shafts, while holding close tolerances. Each welded-steel tube is cut to length at 18.453 in. Wall thickness equals 0.134 in. x 1.195-1.205 in. OD.

Most of the machines which shape these hollow shafts are completely automatic. However, some are loaded and unloaded manually. Conveyors reduce handling costs.

Grooves Stock — An overhead crane fills a feed hopper on the cutoff machine with tube stock. This stock advances along a cable to a stop. Before each tube is cut to length, a forming tool grooves and chamfers a section of the stock.

After cutoff, the partially-shaped tubes drop into a skate conveyor. At this time, the stop retracts and swings 90°. This lets the stop enter a cage filled with rollers which controls stamped markings.

The stamper codes every tube by rolling depressed markings into the metal. After coding, the tubes discharge to a special skid via an inclined chute. Cutoff, chamfering, grooving and stamping output equals about 450 lengths per hour.

Rough Grinding—A fork truck picks up the loaded skid and transfers it to a rough-grinding line. The driver raises the skid above a feed rack; then the skid's hinged bottom opens. This lets the tubes roll down a short magazine into a racking device.

One at a time, the tubes feed from the rack into a rough-grinding line. Actually, there are two of these lines. Both are stacked and fed in the same manner.

Centerless grinders insure straight outside diameters, even when the tube stock is slightly bowed. This precludes straightening problems.

One operator takes care of both rough-grinding lines. Each line consists of three grinders. The first machine in each line has a 24-in. face. This big face grinds for straightness and removes about 0.01 in.

Good Output — Conveyors feed the tubes through the next two grinders. These grinders have 6-in. faces and their wheels are somewhat harder than the initial grinder. The second grinder removes 0.002

in. Its mate grinds 0.001 in. from the tube diameters. In an 8-hour shift, the dual lines grind 2200 tubes.

Rough-ground tubes from the two lines discharge onto a cleated-rubber belt. This belt moves the tubes along to an inclined conveyor which feeds another magazine.

From the magazine, all tubes drop into a facing and boring machine's hopper. In this double-ended machine, both ends of each tube are rough and finished bored. One end of each tube is bored to 0.625 in. The other end is bored to a depth of 2.9375 in.

Indexing Drum — An indexing drum controls all boring work. It also fixes the depth of a stepped-face cut on one end of every tube. The other end of each tube has 1/32 x 45° chamfers. These chamfers were cut when the tube stock was grooved, prior to cutoff.

All boring and facing cuts are made in separate indexed positions. Solid-carbide boring tools throw the chips into the tubes. This keeps stringy chips from clogging the machine. Output is 240 tubes per hour.

Chip Free—As the tubes leave the machine, they drop onto another conveyor. This conveyor carries the tubes to a chip remover. an air-operated tube pushes through every tube to remove the main mass of chips. Then a jet of air blows out the fine chips.

While a scrap conveyor carts the chips away, the tubes roll into another magazine. This magazine has inclined holders which deposit the tubes in a hopper. One hopper feeds two finish-grinding lines.

Each finish-grinding line consists of two centerless grinders. In each line, the first grinder removes 0.004 in. and the second grinds off 0.001 in. As the tubes leave these lines, they shine with a 30 microinch finish.

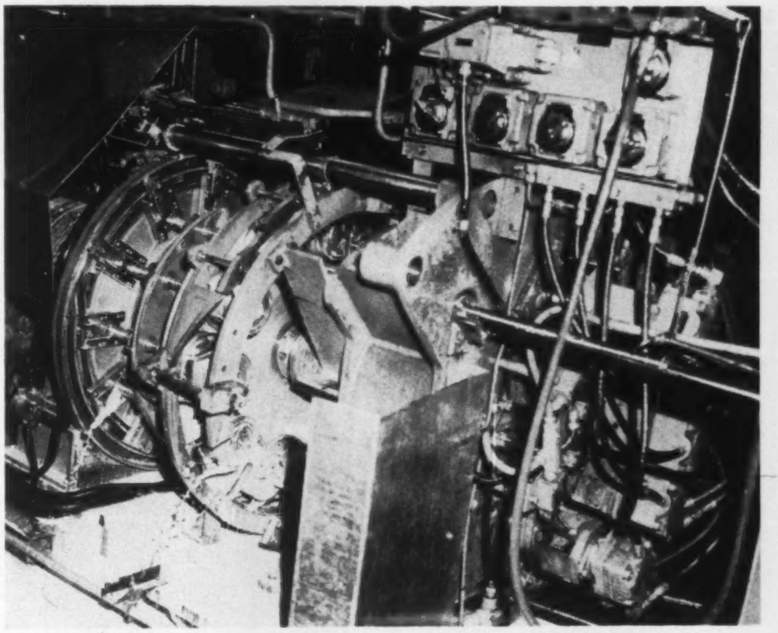
One man operates each line. Combined output is about 410 tubes per hour.

Trim to Shape — Finish-ground tubes discharge into an inclined magazine. An operator picks up two tubes at a time and gages their bores. Then he sets the tubes in a trimmer.

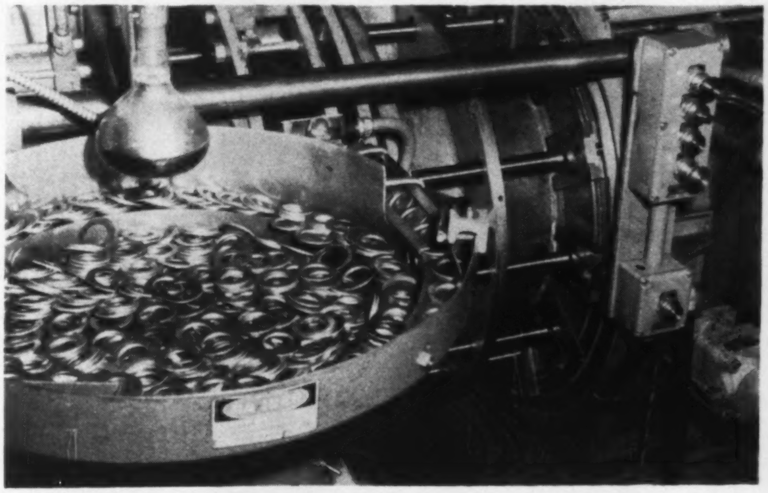
Air clamps hold the tubes while the trimmer shears away most of the rear-end bore wall. The trimmer leaves two small "ears" that protrude ⅛ in. from each tube's main body. Both extensions are 0.369-0.371 in. wide. Chamfers on these ears were cut when the tube stock was grooved, prior to cutoff.

Now, the tubes are ready to receive washer-like flanges. An indexing machine slides one flange over each tube's stepped end. At another station, the machine spins a second flange over the other end of every tube.

Spinning causes some distortion. To restore bore size, a reamer automatically passes through the finished drive tubes.



QUICK INDEXING: Finish-ground shafts receive flange washers as machine indexes through stations. Minor machining also takes place.



HOPPER FED: Flanges, with ground faces and beveled holes, feed into a drum fixture. Spinning rolls fasten these flanges to tube ends.

Magnets Space Sheets at Press

Floating Action Permits Easier Handling

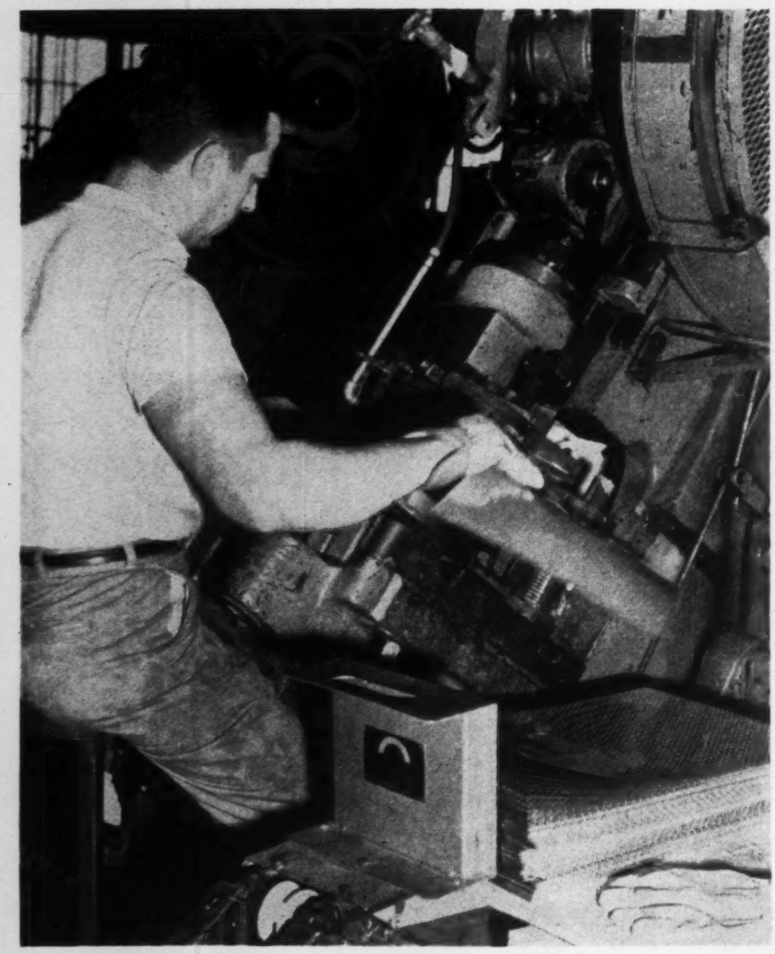
Handling ferrous parts is a simple chore for magnets.

One company uses both their ability to repel and attract to increase its production.

▪ Press output at Atlantic Can Co., Delawanna, N. J., has been increased by about 50 pct. Most of this increase can be attributed directly to the use of devices such as magnetic rails and sheet fanners.

Can forming at Atlantic centers around four basic operations. They are coloring, fabricating, beading, and flanging. Can bodies get their first shape in lock-seaming machines. These machines form the hollow cylinders.

The hollow rounds, resting on their sharp edges, ride on a belt from the seamers down a chute where they change direction and exit on their sides. The most critical phase of can manufacture comes here, where the bodies must be forced-fed into a flanger-beader machine.



SUSPENDED SHEETS: Magnetic induction of sheet ends causes them to repel each other. The ends nearest the fanner rise, ready for use.

Low-Cost Move — The conventional conveyor is able to position cans properly, but it cannot feed them correctly into the flanger-beader without elaborate rigging. Eriez Mfg. Co., Erie, Pa., solved the feeding problem by installing its magnetic rails.

The magnetic rails, mounted beside the conveyor belt, hold the cans tightly to the belt while they are whisked into the flanger-beader in the correct position. The magnetic holding power comes from powerful permanent magnets which require no maintenance.

While container bodies are being formed, presses stamp covers and bottoms. Here, portable-sized Sheet Fanners improve production rates and cut down rejects by separating sheets that tend to cling together.

Floating Action—The fanner is positioned next to a stack of metal sheets. Magnetic induction of sheet ends causes them to repel each other so that ends nearest the fanner rise with open spaces between each sheet.

As one sheet is removed, the next rises in somewhat of a floating position. Full floating action, where the entire sheet is suspended in mid-air, can be had by placing a heavy-duty fanner on all four sides of the sheet stack.

Before the fanner was installed, the operator often had to leave his machine to hand fan 200 or 300 sheets at a time. He then hand fed each sheet into the press. The time delay in hand fanning held production to 2000 lids per hour below the machine's rated capacity.

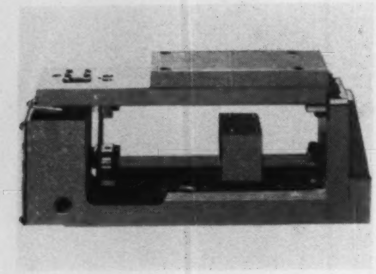
Hand fanning also permitted a few sheets to go unseparated. This causes doubles to be pressed. Some sheets were scratched as a result of dragging one over another.

New Alliance–New Processes–NEW ECONOMY

From Bound Brook's newly-formed association with the world-wide organization of Birfield Limited, comes the new Ferrocite process—making possible economies of operation never before available in self-lubricated iron bearings of Bound Brook quality. The high standards of Powdiron® quality have been retained, but the resultant economies make Bound Brook your best buy in iron bearings. The next time your specs call for self-lubricated iron bearings, it will pay you to call Bound Brook.

BOUND BROOK BEARING
CORPORATION OF AMERICA
A BIRFIELD COMPANY
Pioneer in Powder Metallurgy Bearings and Parts • Plants at Bound Brook, N.J. and Sturgis, Mich.

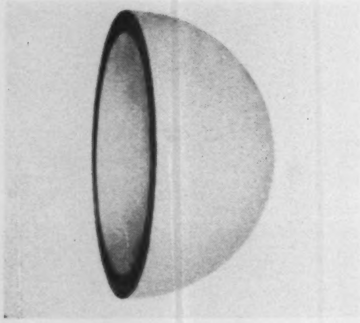
New Materials and Components



Transducer Measures Forces Continuously

Fast response and high accuracy earmark a force transducer. It senses and measures tension, pressure, weight and thrust for control purposes. It measures continuously. A system of cross-spring pivots, combined with a flat cantilever main spring, is the key to the transducer's accuracy. The pivots prevent any movement of the load platform in crosswise or lengthwise planes. But, they allow flexure in a third plane. This feature permits direct mounting on the unit. (Hydro-Pneu-Tronics, Inc.)

For more data circle No. 25 on postcard, p. 113



Process Gives Controlled Porosity in Metals

Controlled porosity in high-temperature parts has widespread use. By means of a new process, engineers can design porous-metal properties into complex shapes. Besides porosity control, the process also gives control of ductility and liquid and air permeability. Related physical or mechanical property regulation is also possible. Materials can be multi-layered, alloyed or impregnated. Finished poducts can be welded, brazed, soldered, formed or machined. A stainless steel wind tunnel model typifies a product fabricated by the process. It permits flow through the nose faster than through the base. (Mott Metallurgical Corp.)

For more data circle No. 26 on postcard, p. 113

Unit Checks Parts Trueness to High Accuracy

Used on a jig grinder or surface grinder, a unit checks trueness of parts. In runout, it is accurate to less than 10 millionths. In concentricity, accuracy is less than 20 millionths. The unit can set up in vertical or horizontal position. In this way, it checks rings, castings, parts, instrument and missile parts. A variable-control motor allows the operator to check parts more accurately with both hands free. Equally-spaced indexing of 2-3-4-6-8-12 or 24 combinations are possible. Working under power, a special slip clutch prevents a jamming or breaking of gears. Controlled wear maintains a true running table. (M & M Tool & Mfg. Co.)

For more data circle No. 27 on postcard, p. 113

Variable-Speed Drives Have Wide Speed Range

Mechanical, variable-speed drives cover the horsepower range of from 1-10 hp. Their wide speed range includes up to 8:1 ratio of speed variation. The drives use a fan on the variable-speed shaft. This allows for maximum cooling of the belt and longer belt life. Shaft shoulders positively position disks. Thus there is no possibility of belt misalignment. The constant-speed disk assembly is saddle mounted on its own bearings. The result is vibration-free operation. The transmission case wraps tightly around the disks. This permits maximum overall dimensions. A gear reducer provides low output speeds. (Western Gear Corp.)

For more data circle No. 28 on postcard, p. 113

LOOK at these RENTAL PRICES

(LOW HOURLY "WAGE RATES" BASED ON 40 HOURS PER WEEK)

1

BAND FILER

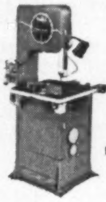
16¢

Accurate high-speed filing work

2

UTILITY MACHINE

26¢



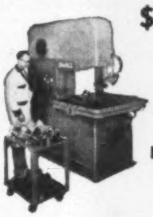
Light-duty all-purpose manual operation

Here are hourly "wage rates" for just 16 of many DoALL machine tools. It shows you the extremely low cost of putting their great earning power to work in your plant without capital expenditure. Their high productive capacity can earn as much as ten times their "wage rate." Put DoALL machine tools on your payroll to reduce manufacturing costs. There is a best machine for every job. Use convenient coupon below.

3

CONTOUR-MATIC*

$1.76

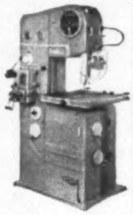


Fixturable table power feed uses HSS saw bands

4

CONTOUR MACHINE

51¢

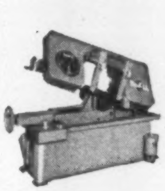


For contour sawing, filing polishing

5

POWER SAW

41¢



For hand-operated cut-off work

6

LAPPING MACHINE

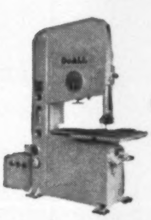
71¢

Ultraprecision dimension finishing

7

ZEPHYR MACHINE

89¢



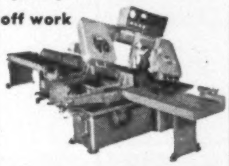
High-speed and friction sawing

8

POWER SAW

$1.44

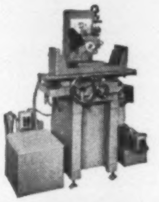
Automatic heavy-duty cut-off work



9

SURFACE GRINDER

33¢



Precision manual operation

10

SURFACE GRINDER

$1.28

Production precision automatic operation

11

BAND MILL

$5.13

For slabbing shanking refacing

12

ANGLE POWER SAW

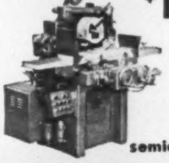
$1.65

Automatic angular cuts up to 45°

13

I/D MICRO-SLICER

$1.80

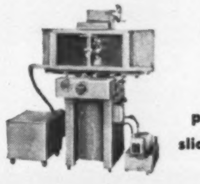


Automatic precision slicing semiconductors

14

MICROTOM-ATIC*

61¢

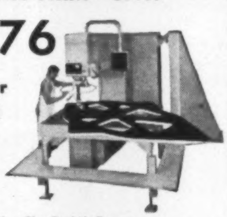


Manual precision slicing and dicing

15

PAN-ARM* SAW

$7.76



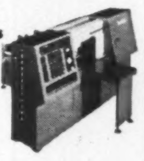
Contour cutting huge parts

16

CONTINENTAL PRODUCTION SAW

$2.40

For continuous heavy-duty cut-off work T. carbide saw bands



*Reg. T.M.—The DoALL Company

MAIL THIS COUPON TODAY!

B-65

THE DoALL COMPANY Des Plaines, Ill.

We want more information on the machines checked HERE:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

*Name*____________________

*Company*____________________

*Address*____________________

*City*__________ *Zone*____ *State*________

**For
Quality
and
Economy
Use**

MALLEABLE

For Service Contact...

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Iron Works, Moline
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Albion Malleable Iron Company,
Muncie Division, Muncie
Link-Belt Company, Indianapolis 6
National Mall. & Steel Castings Co., Indianapolis 22

IOWA
Iowa Malleable Iron Co., Fairfield

MASSACHUSETTS
Belcher Malleable Iron Co., Easton

MICHIGAN
Albion Malleable Iron Co., Albion
Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

MISSISSIPPI
Mississippi Malleable Iron Co., Meridian

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division
Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
National Mall. and Steel Castings Co., Cleveland 6

PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

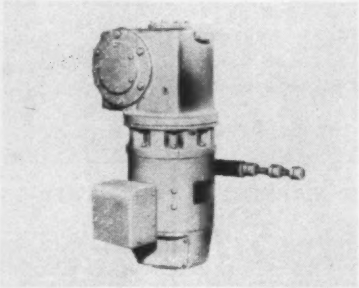
WISCONSIN
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, Inc., West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

**These companies are members
of the Malleable Castings Council**

DESIGN DIGEST

Floating Gearmotors

Runout table and heavy-duty conveyor applications make good use of floating gearmotors. They feature a special seal. It prevents the lubricating oil in the gear casing from leaking into the windings of the integral motor mounted below the gear unit. This results in continuous fail-safe operation. The drives effect up to 60-pct savings in aisle space over regular gearmotors. The hollow low-speed shaft permits the unit to be mounted directly on the driven shaft. The gearmotors come in ratings from 1-15 hp. (Westinghouse Electric Corp.)



For more data circle No. 29 on postcard, p. 113

Seals Slippery Strap

Confined to slippery strapping, a new approach to strap sealing uses a special, high-friction mastic compound. It coats the inside surface in the area within which the crimping action occurs. When the crimps are applied, the compound "bites through" slippery strap coating. It provides a strong frictional bond between the metal surfaces. The new seal permits sealing with a minimum of effort. (Signode Steel Strapping Co.)

For more data circle No. 30 on postcard, p. 113

Cut Nylon Gears

Precision, nylon cut gears have molded metal insert hubs. The hub locks radially by means of its hex shape. Axial locking is by means of a channel cut around the hexagonal face. This design offers maximum resistance to shock, torsion and vibration. Strength factor of the gears is the same as that for metal gears using the Lewis formula. This formula assumes that the entire load is borne by a single tooth. The resiliency of nylon in the cut gears distributes any overload over more than one tooth. This minimizes wear and failure. (Climax Metal Products Co.)

For more data circle No. 31 on postcard, p. 113

Conveyor Swivel Hooks

Made of high tensile, manganese bronze, conveyor swivel hooks have longer life. They require no lubrication and permit heavier loads. A heavy filet buttresses the right angle from the top of the hook. This filet resists distortion or failure due to overloading or rigorous service. The lower "V" angle is 75 degrees. This provides greater security for the load and a generous safety factor in operation. (Dormont Allen Co.)

For more data circle No. 32 on postcard, p. 113

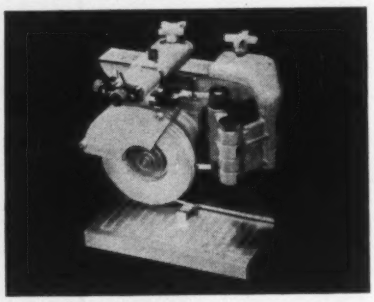
Machining Base

A water-soluble, machining base sinks aluminum chips and prevents caking of aluminum fines. By replacing conventional oils, the base increases grinding wheel life up to 40 pct, in some cases. The base also has high resistance to bacterial growth. (Baker/Gubbins Co.)

For more data circle No. 33 on postcard, p. 113

Contour Wheel Dresser

Spindle mounted, a contour wheel dresser dresses complex shapes in grinding wheels. Accuracy is to "tenths." The device is a 1:1 ratio template tracing wheel dresser. It fits most surface grinders using a 7-in. diam wheel or less. The device will dress wheels from 7-in. diam by 4-in. wide, down to the smallest mounted wheels. The mounting cast-



Tool and Hardware Manufacturers Use Malleable for the Parts They Guarantee...

"Guaranteed Against Warping or Breaking" is the seal of quality often found on tools and hardware made of Malleable iron. Frequently Malleable components are guaranteed while the other materials in the same tools are not.

Proven performance superiority has induced many tool and hardware manufacturers to switch to Malleable castings so they, too, can guarantee their products. At the same time, they often reduce their costs. How? Because Malleable provides more strength per dollar than any other metal; Malleable is the most machinable of all ferrous metals of similar properties; Malleable is truly outstanding for its toughness, ductility, castability and corrosion resistance. While Malleable's natural appearance is attractive, a wide variety of finishes can be applied for added customer appeal.

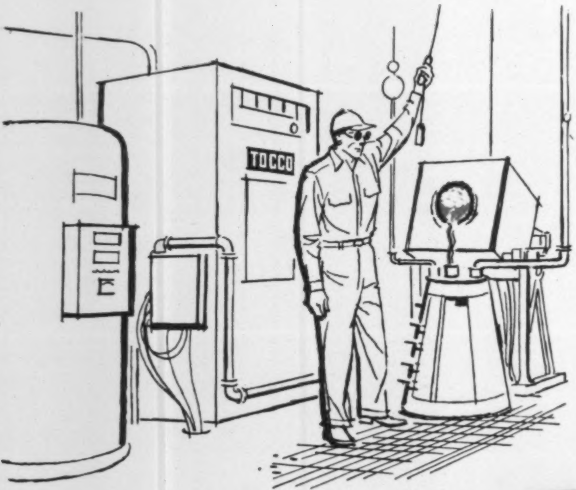
Improve your products by using Malleable castings. Check with any Malleable producer that displays this symbol —

MEMBER
MALLEABLE
CASTINGS COUNCIL

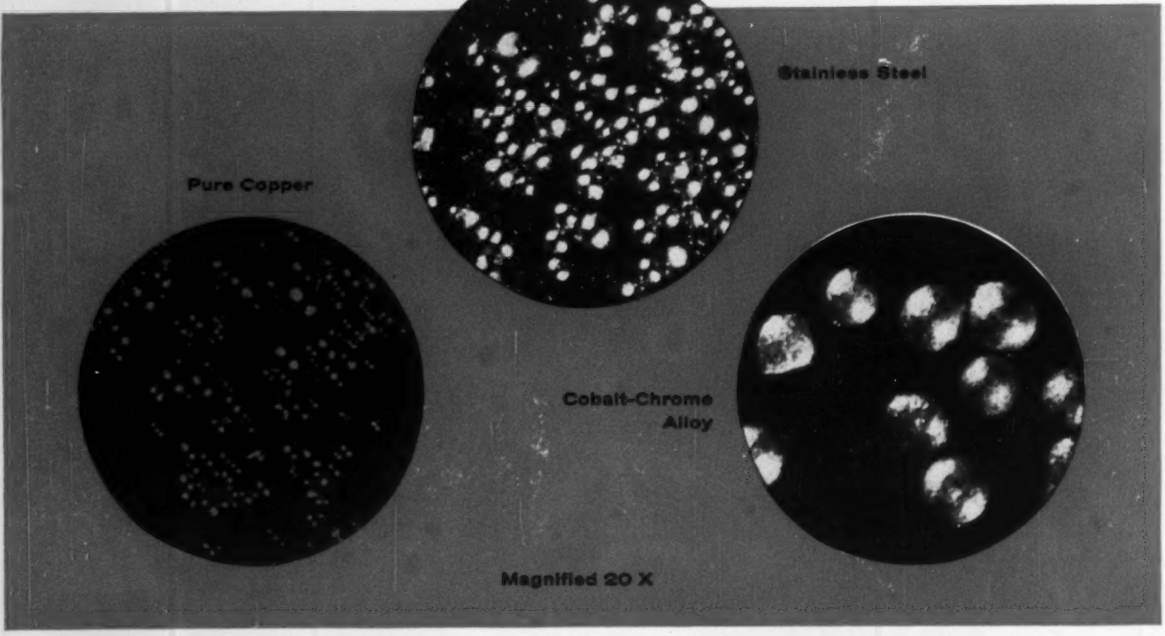
Profitmaking Ideas are yours free in our Data Unit No. 114, available from any member foundry, or Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

Data Unit
MALLEABLE
IRON
CASTINGS

The manufacturer of this unit converted his entire line of machinist vises to Malleable... then guaranteed them against breakage. Not one claim has been made in three years!



TOCCO Induction Melting provides precise control for new metal powder process



A new metal atomization process produces fine, pure, high-temperature metal and alloy powders of accurate particle size and shape. It was developed by Federal-Mogul Division of Federal-Mogul-Bower Bearings, Inc. at their Research Laboratories in Ann Arbor, Michigan.

A very important part of this process is the ability of the Tocco melting equipment to produce clean, molten metal, at the exact temperature required, quickly and efficiently. Three interchangeable Tocco melting furnaces used with the Tocco 100 KW 3 KC motor generator and furnace control provide the versatility necessary to enable Federal-Mogul to process many different metals without expensive, time-consuming change over.

Regardless what your metal heating problem is—melting, heating for forming, heat treatment—it will pay you to investigate Tocco application engineered induction heating.

TOCCO

JUST PUSH A BUTTON

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today— NEW FREE Bulletin
The Ohio Crankshaft Co. • Dept. A-2, Cleveland 5, Ohio
Please send copy of "The Case for Induction Melting"

Name________________
Position________________
Company________________
Address________________
City________________ Zone______ State______

ing is bored to fit a 3-in. diam standard spindle. It clamps securely by tightening two screws. (Tracaform Corp.)

For more data circle No. 34 on postcard, p. 113

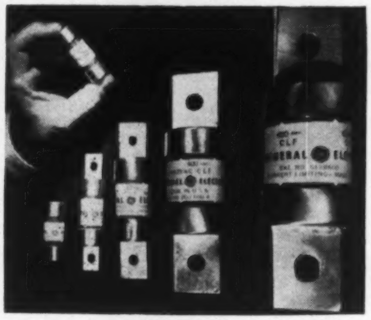
Photoelectric Units

Modulated - light projectors are used in a line of photoelectric protective equipment. The units mount directly on presses and other industrial machines. They stop machine operation automatically. This happens when any part of a person's body enters the danger area. (The Clark Controller Co.)

For more data circle No. 35 on postcard, p. 113

Small-Size Fuses

With a low-wattage loss, switches and other fused devices can run cooler at present ratings. Use of a new line of fuses makes this possible. The fuses are rated from 3-600 amp, 600-v ac. Interrupting capacity is 200,000 amp rms. Closer fusing and reduced derating factors are other advantages encountered with the use of the fuses. The fuses have bonded end caps. These eliminate emission of flames and increase mechanical strength. (General Electric Co.)



For more data circle No. 36 on postcard, p. 113

Tin Coating

A chemical process deposits a protective tin coating on metal surfaces. The chemical used produces a stable solution. Quick dipping accomplishes coating instantly. The chemical also eliminates most soldering problems on printed circuits, eyelets, connectors and plugs

Leads the way to
DEPENDABLE
LIFTING

Lodestar
1/2 TON
CM
CM
UP
DOWN

...quality leader in electric chain hoists

performance... the real test
Many thousands in all types of service demonstrate that you, too, can profit from more efficient Lodestar handling...at lower costs and increased productivity.

attractively priced...
Initial cost surprisingly low...operates for pennies per day...built to serve you without costly maintenance.

end your hoist problems...
Select Lodestar from a complete range of capacities and speeds...1/8 to 2 tons and 8 to 60 fpm. Interchangeable lug, hook and trolley suspensions.

Outstanding **Lodestar**® *features include...*

CONVENIENT PUSH BUTTON OPERATION—Precise and safe load control.

LOWEST HEADROOM—For highest lifting... unmatched by any other hoist of similar type.

HEAVY DUTY PERFORMANCE—Ruggedly constructed to withstand the heavy demands of severe service.

DEPENDABLE DUAL BRAKING—Instantaneous acting, self-adjusting magnetic brake, plus ultra-modern regenerative electric braking.

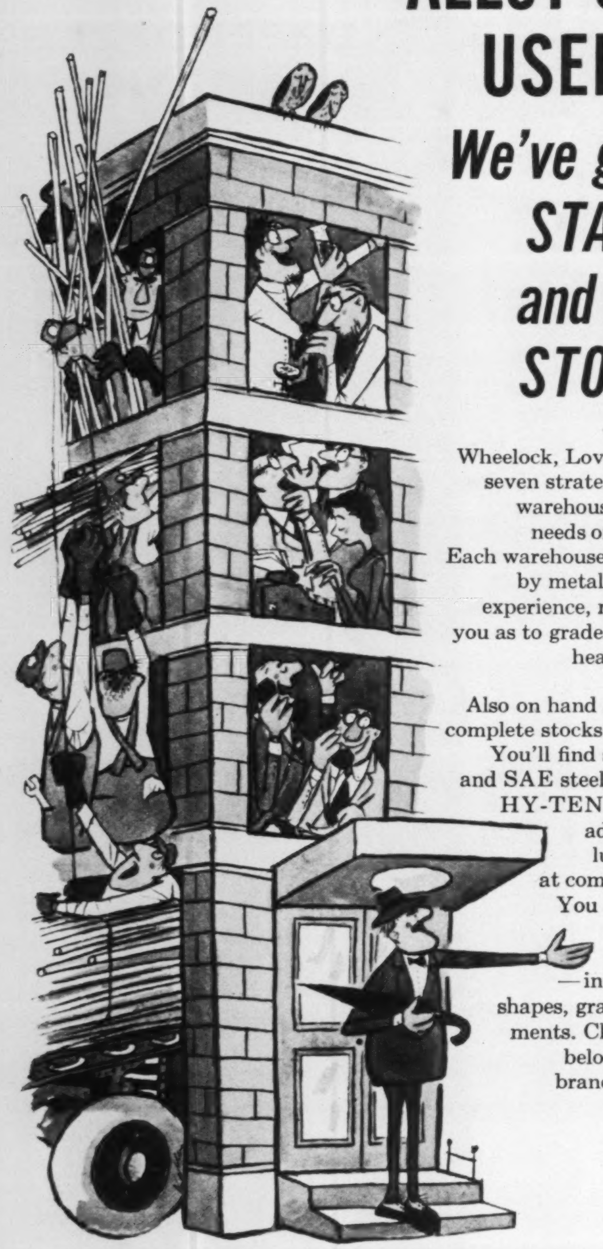
FLEXIBLE WELDED LINK CHAIN—Famous CM-ALLOY type flexes freely in all directions... permits angle lifting ... easily inspected... extremely long wearing.

MINIMUM MAINTENANCE—Introduces new standards of maintenance-free service.

Request catalog and name of local stocking distributor

CM® HOISTS

CHISHOLM-MOORE HOIST DIVISION
Columbus McKinnon Corporation
FREMONT AVE., TONAWANDA, N.Y.
NEW YORK • CHICAGO • CLEVELAND
In Canada: Columbus McKinnon Limited
St. Catharines, Ont.



ALLOY STEEL USERS!

We've got the STAFF... and the STOCK

Wheelock, Lovejoy maintains seven strategically-located warehouses to serve the needs of its customers. Each warehouse is fully staffed by metallurgists of long experience, ready to advise you as to grades, applications, heat treating, etc.

Also on hand at all times are complete stocks of alloy steels. You'll find standard AISI and SAE steels, and our own HY-TEN steels, offering advanced metallurgical features at competitive prices. You can order your alloy steel — as you need it — in specified sizes, shapes, grades, and treatments. Check the listing below for the W-L branch nearest you.

W-L STEEL SERVICE CENTERS – Cambridge • Cleveland
Chicago • Hillside, N. J. • Detroit • Buffalo • Cincinnati
AGENTS – Southern Engineering Company, Charlotte, N.C.;
Sanderson-Newbould, Ltd., Montreal and Toronto

"The Alloy Steel Center"

WHEELOCK,
LOVEJOY
& COMPANY, INC.
130 Sidney St., Cambridge 39, Mass.

STEEL SERVICE CENTER INSTITUTE

and other electronic hardware. It can also be used for preventing oxidation and for whitening copper, copper-based alloys and other materials. (Shipley Co., Inc.)

For more data circle No. 37 on postcard, p. 113

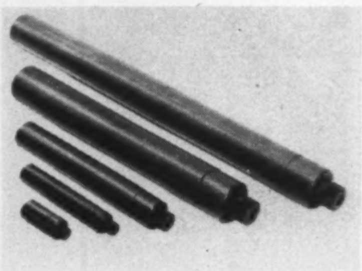
Rust Preventatives

Water-displacing, rust-preventative oils prevent rust after deburring, barrel cleaning and burnishing. The oils serve well for in-between operations. They come in three grades. One leaves a light monomolecular film. Another leaves a soft non-drying film, and a third leaves a hard waxy film. (Patclin Chemical Co., Inc.)

For more data circle No. 38 on postcard, p. 113

Jig Legs

Simply assembling four of the manufacturer's jig legs on a plate makes simple plate jigs. Leg ends and rest buttons are hardened for increased wear. Larger bearing surface at leg top insures lasting accuracy in plate-type jigs. The large rest buttons on top provide adequate clearance to protect drill jig bushings and heads on top side. Large diameters of rest buttons on top offer more bearing surface for spot facing or counter boring on opposite side. (Jergens Tool Specialty Co.)



For more data circle No. 39 on postcard, p. 113

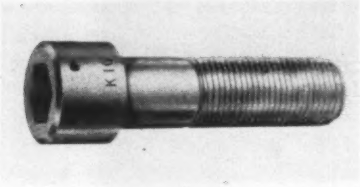
Self-Locking Insert

For fastening applications up to 1200°F, a self-locking insert eliminates seizure and galling. This holds true when it is used in equipment that is screw-thread assembled. The insert is precision-formed to a diamond shape and coiled to provide the thread. It attains its unusual locking effect from a "grip coil" midway in its length. Use of the insert eliminates lock-nuts, lock-washers and lock-wiring. (Heli-Coil Corp.)

For more data circle No. 40 on postcard, p. 113

Socket Screw

High-performance, socket head cap screws have two to four times the fatigue life of comparable industrial fasteners. The socket and head are forged. The threads have smooth radiused roots which are rolled on hardened blanks. This gives added fatigue strength. (Standard Pressed Steel Co.)



For more data circle No. 41 on postcard, p. 113

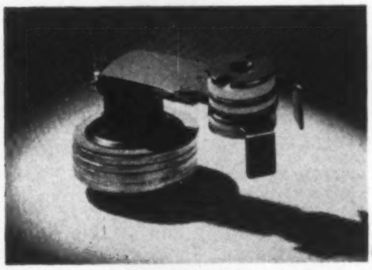
Stripping Agent

Self - activating, a gelatinous stripping agent removes epoxy and polyester-based coatings. It applies by brushing or spreading. The agent adheres to all surfaces—contoured or vertical. When the part is stripped to requirements, the residue removes easily. Parts or surfaces can be worked on immediately without cleaning or further treating. (Narmco Industries, Inc.)

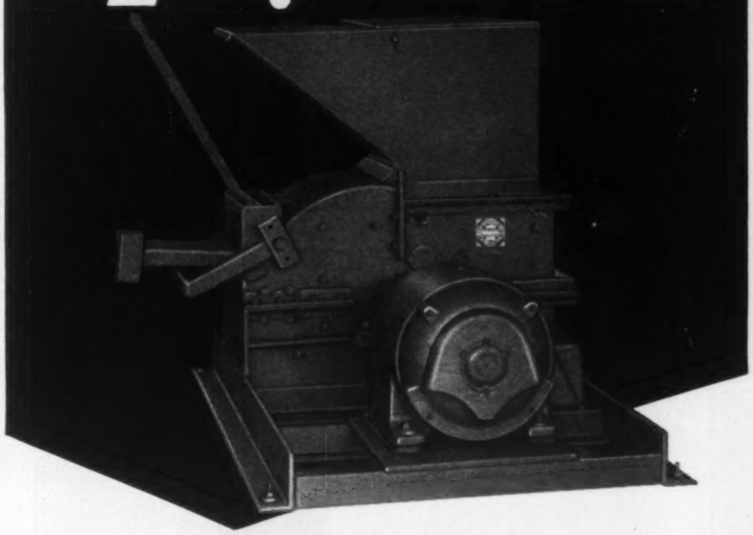
For more data circle No. 42 on postcard, p. 113

Shuts Current Off

A switch uses the principle of a suspended weight maintaining its vertical position at all times. Thus, when properly mounted in an appliance, the switch contacts are held closed until the appliance tilts 30 degrees or more. At this point, the



NEW! Model No. 1800



AMERICAN ROLLING RING METAL TURNINGS CRUSHER

Designed for the plant with a smaller volume of metal turnings. If your plant produces 20 to 200 tons of metal turnings monthly, the American 1800 Crusher will bring you additional profit on the sale of crushed turnings plus savings in cutting oil, man-hours, plant space, and tool maintenance.

3 *IMPORTANT WAYS AN AMERICAN 1800 CRUSHER BRINGS NEW PROFITS!*

- **SHOVELLING TURNINGS BRING $3 TO $4 MORE PER TON!** A daily crushing capacity of only 2 tons will produce an additional profit which will pay for the equipment **in less than a year** and give you a handsome profit thereafter.
- **30 TO 50 GALLONS PER TON IN RECOVERED CUTTING OIL!** American-crushed turnings release oil more freely, are easier to handle in chip wringer, and prolong tool life through more liberal use of reclaimed oil. **Savings in cutting oil alone can pay for an American Crusher.**
- **UP TO 75% LESS STORAGE SPACE NEEDED — EASIER HANDLING!** Valuable savings in factory space; chips load heavier, easier in freight cars — substantially cut shipping costs.

OTHER AMERICAN CRUSHERS WITH CAPACITIES UP TO 30 TONS PER HOUR

Write today for free literature on Model 1800 Crusher or for more information about the American Crusher best-suited to your needs!

American
CRUSHER

American PULVERIZER COMPANY
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
1439 MACKLIND AVE. ST. LOUIS 10, MISSOURI

vertical weight remains in position. It exerts a lifting motion on the operating contact spring, which opens the circuit. (Norwalk Thermostat Co.)

For more data circle No. 43 on postcard, p. 113

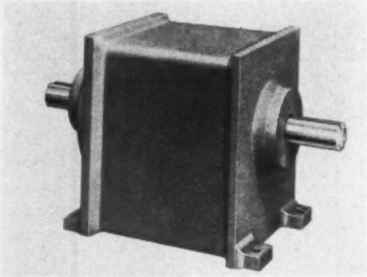
Air-Vent Silencers

Return-air-vent silencers prevent the transmission of noise from one area to another through transfer grilles. A sound trap allows the passage of air. But, it impedes the flow of annoying sound between rooms. (Koppers Co., Inc.)

For more data circle No. 44 on postcard, p. 113

Clutch and Brake Unit

All types of industrial machines, special machinery and automation equipment can make use of this clutch-brake drive. An integral welded steel housing contains the clutch and brake. They operate in a self-contained bath of oil. Any type of three-way pneumatic or hydraulic valve can actuate the clutch.

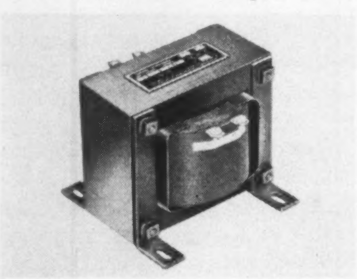


The brake is spring operated. It releases automatically by mechanical interlocking with the clutch. Maximum operating speed is 1200 rpm. (Sommer Assoc.)

For more data circle No. 45 on postcard, p. 113

Transformers

A line of transformers takes less-than-average panel space. They are particularly suited for use with rectifier and lighting loads. Coils are precision wound and rigidly blocked. Conservative spacings in construction of the units provide an

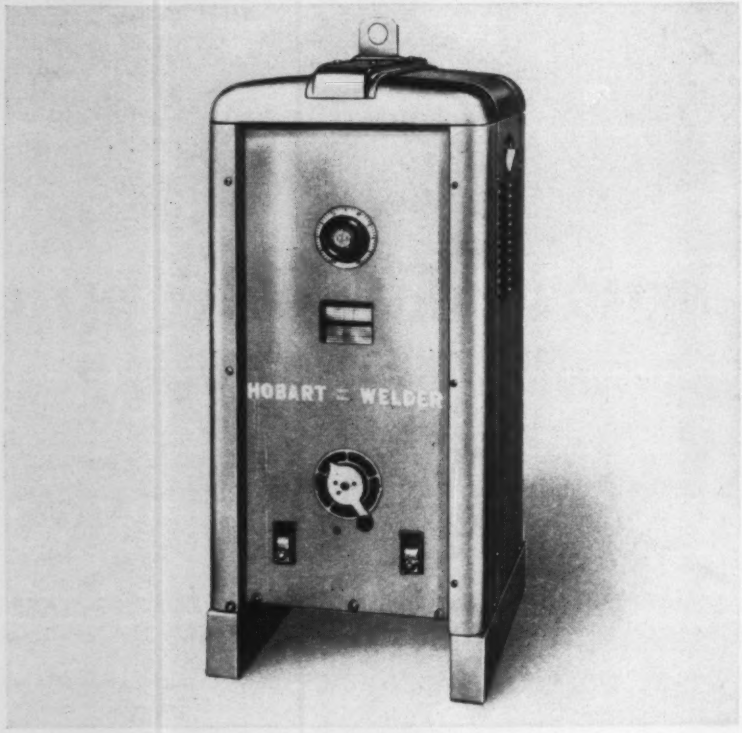


extra safety factor. Installation is simple. The transformers have wiring diagrams on the nameplates and slotted mounting feet. Screw-type terminals eliminate the need for terminal boards. (Hevi-Duty Electric Co.)

For more data circle No. 46 on postcard, p. 113

Coolant Filter

The ease and quality of grinding performances are made possible through the use of a coolant filter. Savings of labor and cutting fluids are also effected. The filter employs a special filtering aid compound. Added to the coolant, it forms a porous cake on the filtering elements. As a result, all suspended



"BUDGET 650"...A NEW LOW COST HOBART AC WELDER ...BUILT TO "TAKE IT" ON RUGGED OR OVERSIZE PRODUCTION

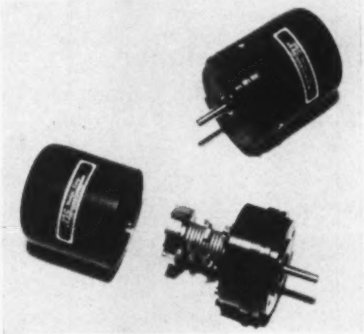
This sturdy "Budget 650" (650 amp) AC Welder, low in initial cost, is an exceptional value for oversize production requirements. Here's a welder with top performance and high operating efficiency for lowering operating costs. Hobart's exclusive "diverter path" design eliminates the need for troublesome moving coils and cores, arc boosters and extra gadgets. If your welding operations call for larger capacity, you can depend upon this "Budget 650" to give you long life service. The new design also permits welding at 500 amps on 100% duty cycle . . . for attractive price and complete specifications write for bulletin A-627.

HOBART BROTHERS CO., BOX IA-21, TROY, OHIO
Ph. FE 2-1223 *"Manufacturers of the world's most complete line of arc welding equipment"*

foreign matter, down to one micron, is effectively trapped. (Dundick Tool Works, Inc.)
For more data circle No. 47 on postcard, p. 113

Limit Stop Assembly

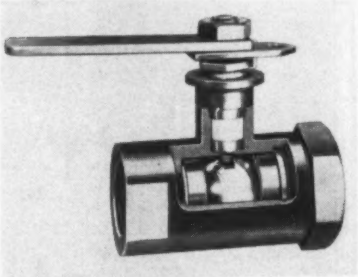
A precision, limit stop assembly provides fully-adjustable rotational limit control. Its operational range is 30° to 4530°. In a 3/16-in. shaft size, the assembly comes in ball or oil-less bronze bearing types. Self-contained in a black anodized case, the unit adjusts readily. It does this by the setting of a series of washers. (PIC Design Corp.)
For more data circle No. 48 on postcard, p. 113



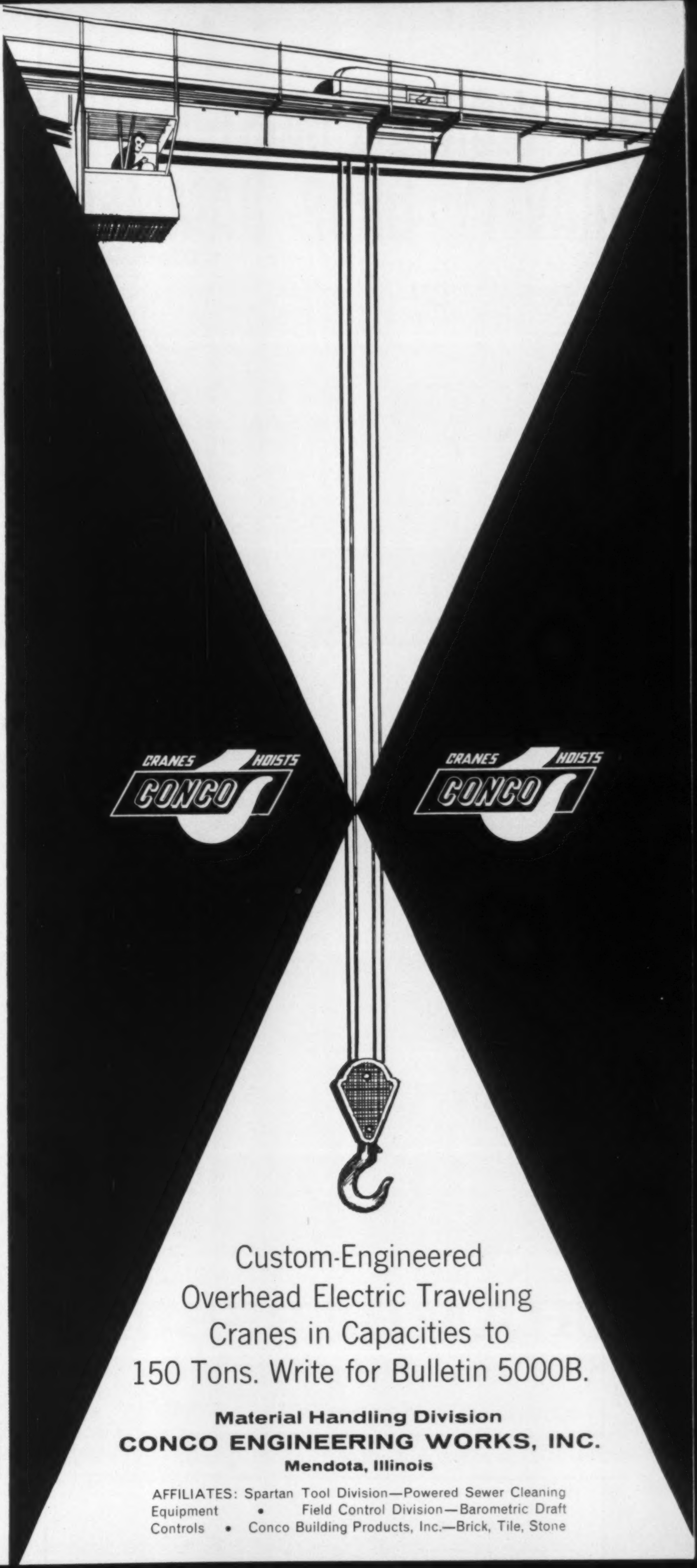
Brightens Zinc Plating

For zinc plating, a liquid brightener can be added directly to the bath, without prior dilution. The brightener applies a uniformly bright zinc plate to low-current-density areas. It is suitable for use in barrel, as well as hand, hoist or automatic plating operations. The brightener also puts full, bright deposits on case-hardened or hot-rolled steels. (Metal & Thermit Corp.)
For more data circle No. 49 on postcard, p. 113

Ball Valves



A line of ball valves handles practically any fluid. They come in combinations of metals, seats and



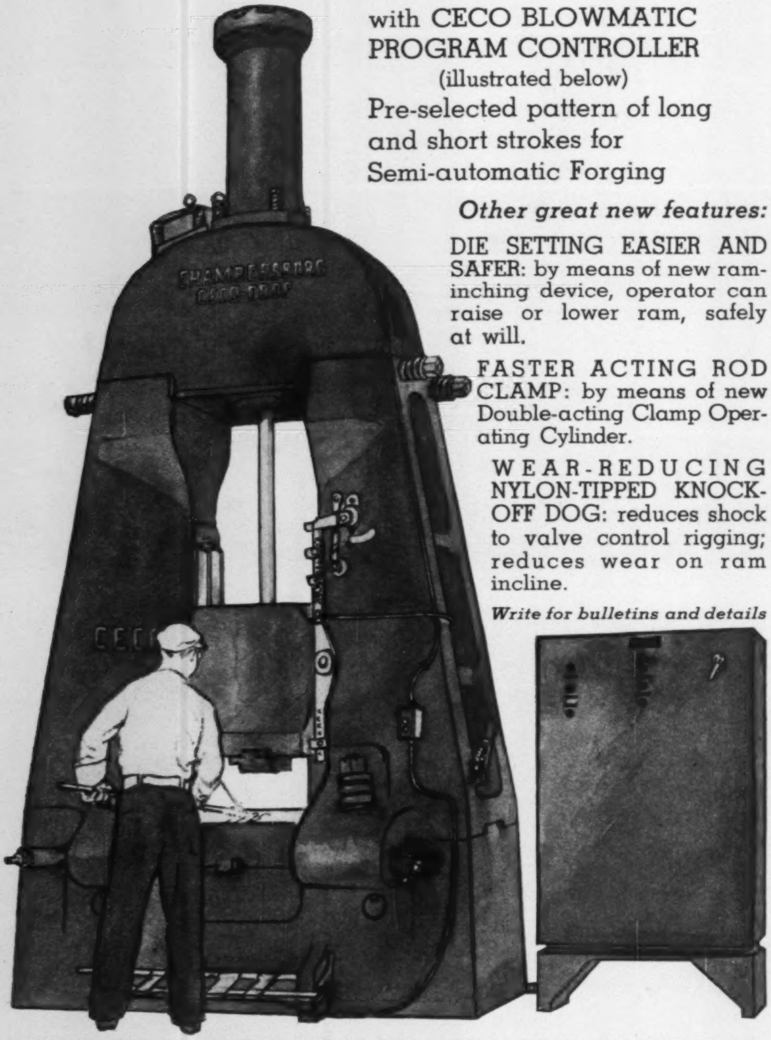
Custom-Engineered Overhead Electric Traveling Cranes in Capacities to 150 Tons. Write for Bulletin 5000B.

Material Handling Division
CONCO ENGINEERING WORKS, INC.
Mendota, Illinois

AFFILIATES: Spartan Tool Division—Powered Sewer Cleaning Equipment • Field Control Division—Barometric Draft Controls • Conco Building Products, Inc.—Brick, Tile, Stone

THE WORLD'S MOST MODERN GRAVITY DROP HAMMER--

The IMPROVED CECO-DROP



with CECO BLOWMATIC PROGRAM CONTROLLER
(illustrated below)
Pre-selected pattern of long and short strokes for Semi-automatic Forging

Other great new features:

DIE SETTING EASIER AND SAFER: by means of new ram-inching device, operator can raise or lower ram, safely at will.

FASTER ACTING ROD CLAMP: by means of new Double-acting Clamp Operating Cylinder.

WEAR-REDUCING NYLON-TIPPED KNOCK-OFF DOG: reduces shock to valve control rigging; reduces wear on ram incline.

Write for bulletins and details

CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PA.

CHAMBERSBURG

• The Hammer Builders •

DESIGNERS AND MANUFACTURERS OF THE IMPACTER

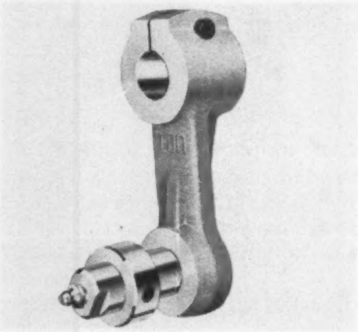
When it's a vital part, design it to be FORGED

seals. A self-adjusting ball seals with flow in either direction. A stem shoulder prevents ball from being forced downward. Sizes range from ¼-2½ in., for pressures up to 400 lb water-oil-gas, and temperatures to 450°F. (Homestead Valve Mfg. Co.)

For more data circle No. 50 on postcard, p. 113

Drive Tensioner

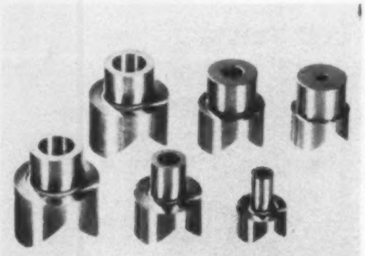
A universal drive tensioner easily locks into position, and mounts at any point on a shaft. It will take up slack in the chain and belt drives. The tensioner arm insures exact tensioning. This arm rotates and locks in any position on a 360 degree arc. (Brewer Machine & Gear Co.)



For more data circle No. 51 on postcard, p. 113

"V" Bushing Liners

Cylindrical, square and hex stock can be precisioned drilled with the aid of "V" bushing liners. They provide automatic, accurate self-centering. The hardened ground liners can be used with any type of cylindrical, square or hex stock drilling. Acting as a liner for removable bushings, the liners groove

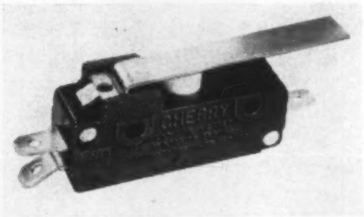


themselves dead center on stock to be drilled. They even permit center drilling near the ends of bars. (Acme Industrial Co.)

For more data circle No. 52 on postcard, p. 113

Snap-Action Switch

Featured in a snap action switch is a low-operating force, hinged-lever actuator. Case-pivoted actuator arm comes with roller, straight lever with length and form variation for cam, roller or straight-line actuation. Terminals accept standard quick-connect or solder-wiring connections. (Cherry Electrical Products Corp.)



For more data circle No. 53 on postcard, p. 113

Slide Assemblies

With hardened steel ways, a line of slide assemblies comes in 33 practical saddle-and-base size combinations. The assemblies can take heavy loads and long maximum stroke lengths. The ways and all wear surfaces on the saddle are precision ground. A bronze gib with adjusting screws regulates slide clearance. Retainer wear strips are mounted under the saddle on each side. They hold the saddle to the base. This construction makes it practical to mount the slide assembly in a horizontal, angular or vertical position. (Russell T. Gilman, Inc.)

For more data circle No. 54 on postcard, p. 113

Lining Steel Pipe

A certain method applies a seamless, corrosion-resistant vinyl lining to interior walls of steel pipe. A special roller-coater applies a Geon vinyl plastisol to the interior walls of pipe ranging from 3-36 in. in diam. Lengths can be as long as 60 ft. The lining is from 1/16-⅛ in. thick. This plastisol lining is resistant to a large variety of chemicals, both acid and alkaline. It resists temperatures up to 180°F. (Lithcote Corp.)

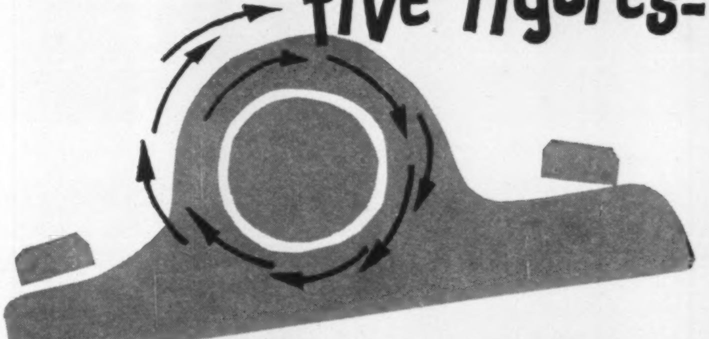
For more data circle No. 55 on postcard, p. 113

Small AC Motors

A round peg in a square hole reduces the overall size of large ac motors. In effect, the motor has a round stator inside its nearly-square frame. This unusual arrangement provides better cooling. The result is—a smaller overall dimension for any given horsepower rating. The motors come in horsepowers from 125-300. Drip-proof enclosure is standard; splash-proof enclosures can be specified. (Reliance Electric & Engineering Co.)

For more data circle No. 56 on postcard, p. 113

When RPM's get into five figures-



consider **Lubri-Case**

(-the sulphur case lubrication process that imparts superior bearing qualities to iron & steel)

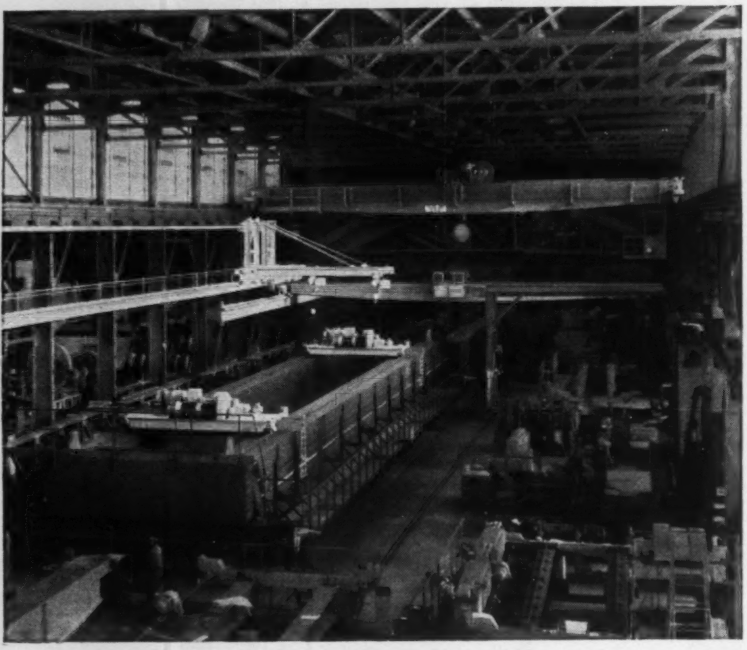
The high speeds expected from modern mechanisms have caused failure in many non-ferrous components. To take the strain, and to maintain the clearances necessary for adequate lubrication the use of all ferrous parts becomes necessary.

On such parts Lubri-Case, a sulphur case treatment, produces a case high in sulphur on most ferrous materials imparting load bearing, long wearing, lubricating properties even in castable and machineable low cost iron and steel. Lubri-case has been use tested in many applications under high speeds, heavy loads, elevated temperatures and close tolerances.

Drever Company, heat treating specialists since 1939, can Lubri-Case process your "specials" or your production quantities. Write or phone for details.

DREVER COMPANY
• HEAT TREATING DIVISION •
RED LION RD. & PHILMONT AVE. • BETHAYRES, PA. • WIlson 7-3408

OVER-ALL . . . it's SHEPARD NILES JOB-MATED Cranes and Hoists



All of your material handling operations become more profitable, efficient and reliable when they are handled by Shepard Niles JOB-MATED Cranes and Hoists. Production moves faster, more efficiently, and you increase usable storage space.

Why? Simply because Shepard Niles equipment is JOB-MATED, quality built. Each JOB-MATED Crane and Hoist is specially designed with the right combination of capacity, clearance, speed, controls and components to handle its particular job best. Because they are accurately matched to the job, they give you the best service, for the least cost. And they continue to give top performance long after they repay your investment.

It will pay you to find out how Shepard Niles JOB-MATED Cranes and Hoists can reduce your costs. For further information, write for our descriptive bulletin, and ask to have a Shepard Niles representative call.

America's Most Complete Line of Cranes and Hoists

SHEPARD NILES
CRANE AND HOIST CORPORATION
1460 Schuyler Ave., Montour Falls, N.Y.

NEW FILMS

How **"The Constant Search"** led to the first industrial power use of a stationary jet aircraft engine, is told in a film. The movie follows the development of a jet gas turbine for a natural gas compressor station. It takes in from design to installation and operation. The jet engine is shown in operation as it develops 10,500 rotative horsepower. It does this while pumping 600 million cu ft of natural gas a day northward, from a southern compressor station. Full color, 16 mm, sound. Modern Talking Picture Service, Inc., 3 E. 54th St., New York 22.

"Mass-Production Insurance: the Dependable Die Set" shows how die sets serve our modern mass-production industries. Also shown is the manufacture of die sets, step-by-step. 35-mm filmstrip with record. 15½ minutes. The Producto Machine Co., 990 Housatonic Ave., Bridgeport 1, Conn.

"How to Locate Flaws with Dye Penetrants" demonstrates every aspect of dye penetrant inspections. This includes from laboratory theory to authentic production-line techniques. The laboratory sequence also outlines the proper methods of insuring complete inspection accuracy. On-the-spot sequences include the inspection of wing spars, small aircraft parts, truck wheels, valves, oil tool components, gears and other parts. Full color, sound. 16 mm, 23 minutes. Turco Products, Inc., 24600 S. Main St., Wilmington, Calif.

"Millions on the Move" presents a solution to traffic congestion. The film asks the question—Will you continue to pay the high price of traffic congestion, or will you live modernly with coordinated public transportation? The price we pay is high. It costs Americans billions of dollars each year in depreciating business and real estate values. The film points out the key to removing this congestion. Several dramatic examples show how rapid transit vehicles and modernized rail and bus facilities have stimulated the traffic flow in several cities. Sound, color, 16 mm. 27 minutes. Association Films, Inc., 347 Madison Ave., New York 17.

"New Horizons for Tool Steel" describes manufacturing of tool steel by most advanced methods. These methods include: massive hot pressing and consumable electrode remelting. The film also includes application data on the uses of tool steel in industry. Color, 16 mm, sound. 29 minutes. Allegheny Ludlum Steel Corp., Oliver Building, Pittsburgh 22.

"Fundamentals of Manual Shielded Arcwelding Techniques" consists of two reels. Part one covers flat and horizontal arcwelding techniques. The second reel studies vertical and overhead arcwelding procedures. Featured in the film are clear, camera closeups of the welding arc in actual operation. The primary purpose of the film is operator training. Consequently, the four basic principles of arcwelding are graphically explained. In addition, good and bad examples of arcwelding are examined. Full color, 16 mm, sound. 45 minutes. Air Reduction Sales Co., 150 E. 42nd St., New York 17.

"Automatic Career," for shop and mechanical courses, shows how the automatic screw machine operates, what it makes and how it fits into American industry. Fast-paced, educational and entertaining, it should be shown to those who have a basic knowledge of metalworking practices. Color, 16-mm, sound. 20 minutes. National Screw Machine Products Assoc., 2860 E. 130th St., Cleveland 20.

Hydraulic

Punches

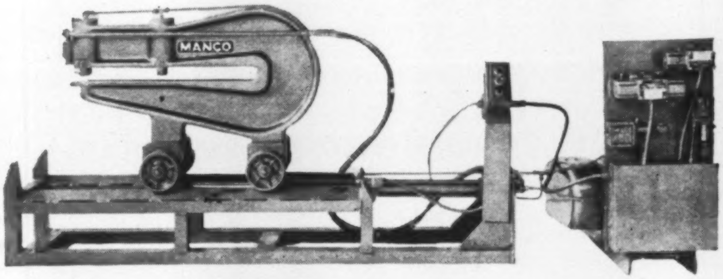
FOR METALLURGICAL TEST SAMPLES
PRODUCTION APPLICATIONS

Manco offers a wide variety of high pressure hydraulic punches for obtaining metallurgical test samples and for production punching applications. Typical is the metallurgical test sampling unit shown above. It punches a burr-free undistorted, 4" diameter sample from .070 mild steel in 2 seconds cycle time. Units can be roller mounted where required. Punches for bench mounting in laboratory also available.

WELD IDENTIFICATION PUNCH

This Manco traverse mounted punch is used to punch "warning holes" adjacent to welds in steel strip. Two burr-free 3/16" holes are punched simultaneously through .150 sheet steel on 12" centers. Punching cycle is 1 second. The wheeled traverse and punch operation is actuated by a single push-button. Complete cycle, 6 seconds.

Write for Complete Information and Catalog



MANCO MFG. CO.
BRADLEY
ILLINOIS

ARMSTRONG

SET-UP and HOLD-DOWN TOOLS

ARMSTRONG PLANER JACK
ARMSTRONG BRACING JACK
ARMSTRONG VERTICAL JACK
ARMSTRONG ADJUSTABLE STEP BLOCK
ARMSTRONG "T" SLOT BOLT
ARMSTRONG "T" SLOT NUTS
ARMSTRONG NUTS
ARMSTRONG WASHERS
ARMSTRONG UNIVERSAL ADJUSTABLE CLAMP
ARMSTRONG SET-UP WEDGES
ARMSTRONG "T" SLOT CLAMP
ARMSTRONG PLAIN CLAMP
ARMSTRONG SCREW HEEL CLAMP
ARMSTRONG GOOSE NECK CLAMP
ARMSTRONG DOUBLE FINGER CLAMP
ARMSTRONG FINGER CLAMP
ARMSTRONG "U" CLAMP

Whatever its shape, a work piece can be quickly, easily and safely set up on any T-slotted table with ARMSTRONG Set-up Tools. Comprising a complete "system" of supporting and holding devices in all essential sizes, ARMSTRONG Set-up Tools usually pay for themselves on the first job and continue to lower costs for years to come.

Save Time: Keep costly machines and high priced men producing—save time otherwise lost while operators rummage in the scrap box for materials with which to devise makeshift set-up methods.

Prevent Breakage and Spoilage—correctly designed, machined from special steels or drop forged and heat treated, they are extremely stiff, strong and reliable.

Increase Accuracy—hold work rigidly and support it fully regardless of shape.

Prevent Accidents—end risk of set-up failure with resulting tool breakage, damage or personal injury.

Increase Profits—by reducing down time, increasing man hour output, assuring accuracy, ARMSTRONG Set-up and Hold-down Tools cut costs and build profits. They are part of every properly equipped tool room and shop.

Your Local Armstrong Industrial Distributor carries a good stock of Set-up and Hold-down Tools. He offers you quick, efficient service on these, as well as other, quality ARMSTRONG Tools.

INDUSTRIAL DISTRIBUTORS — THE RIGHT HAND OF PRODUCTION

ARMSTRONG BROS. TOOL CO.
5205 W. ARMSTRONG AVE. • CHICAGO 46, ILL.

UB
STOCK LIST
SWEDISH
COLD ROLLED
SPRING
STEEL
UDDEHOLM COMPANY OF AMERICA INC.

Send For Your

UDDEHOLM

Spring Steel Catalog-Stocklist

This 44-page booklet provides full information on all grades and sizes of fine UDDEHOLM SWEDISH Specialty Spring Steels. They are produced in our Swedish Mills, from high-purity iron ores. The excellent flatness, uniformity and close thickness tolerances of UDDEHOLM Spring Steels will give you a better product at less cost.

BLUE TEMPERED • ANNEALED
Spring Steels

. . . in different grades, tempers and finishes are some of the types stocked in our modern warehouses. Sizes range from .001" to .125" thick, 1/8" to 16¼" wide. Slitting and edging facilities are also available.

UDDEHOLM CO. OF AMERICA

UB
TOOL & DIE STEELS
COLD ROLLED SPRING STEELS

155 East 44th St., New York 17, N. Y., MUrray Hill 7-4575

Serving American Industry for more than 70 years

Branch Offices & Warehouses—Chicago, Ill.—Cleveland, O.—Detroit, Mich.—Los Angeles, Calif.—Newington, Conn.—Philadelphia, Pa.—**In Canada**—Uddeholm (Canada) Ltd., Montreal—Toronto

PATENT REVIEW

New Patents In Metalworking

Protected Hot Top

Apparatus for and method of providing a protective lining on a hot top, (assigned to Oglebay Norton Co., Cleveland), Nov. 23, 1960. Method and apparatus for applying a protective refractory layer to the interior of a hot top. It's done by means of a telescoping mandrel. British No. 854,607.

Sand-Mold Preparation

Method of preparing a sand mold for an ingot mold, J. W. Nielsen (assigned to U. S. Steel Corp., Pittsburgh), Dec. 6, 1960. In a sand mold used in the production of steel, the stripping ears of the pattern are removed from the sand prior to the parting of the pattern from the mold. This provides a clear passage for separating the mold from the pattern. No. 2,962,781.

Blast Furnace Charge

Material-handling control system, D. W. Fath and C. E. Smith (assigned to Cutler-Hammer, Inc., Milwaukee), Nov. 29, 1960. A control system charges blast furnaces with coke and the like. Nos. 2,962,172-3 and 2,962,175.

Carburized Steel

Carburization of ferrous alloys, O. E. Cullen (assigned to Midland-Ross Corp., Cleveland), Dec. 13, 1960. Method for treating low alloy steel to produce a carburized case having free carbides in a spheroidal condition. They are randomly distributed therethrough. Steel thus carburized has an extremely wear resistant surface. Canadian 610,554.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

Protect your family

KNOW THESE FACTS

1 IF YOUR CHILD HAS A BAD SORE THROAT...

call your doctor, especially if there is difficulty in swallowing, swollen neck glands, high fever, nausea or vomiting. Prompt treatment of "strep" throat can prevent rheumatic fever and rheumatic heart disease.

2 IF YOU THINK YOU HAVE HIGH BLOOD PRESSURE...

see your doctor. Only he can tell. He can usually control it and decrease the chances of heart damage or "stroke".

3 STROKES ARE NOT HOPELESS...

Many patients can be treated effectively. Invalidism can be prevented or reduced.

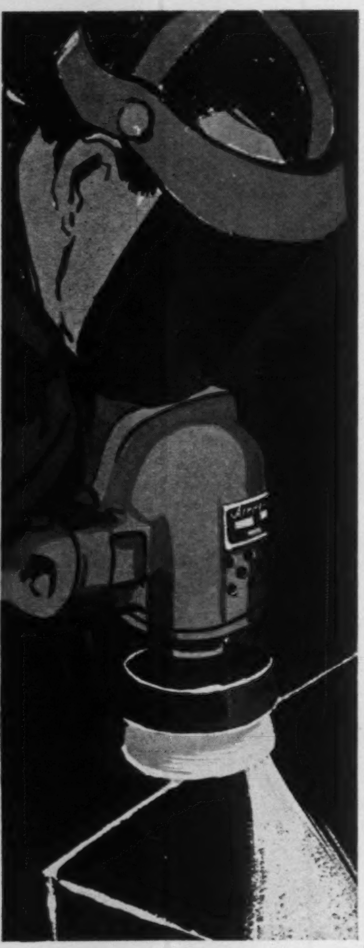
Your Heart Fund dollars helped to produce these advances. But heart disease is still the nation's #1 health enemy. Further progress depends upon your support of medical research.

How you can protect your child against rheumatic fever
Your Blood Pressure
Facts about strokes

Ask your Heart Association for these and other helpful pamphlets.

GIVE to the

HEART FUND



New AIRETOOL MOTOR *muffles* grinding noises . . .

. . . for better working conditions
. . . for greater production

Airetool's new muffled motor cuts nerve-tearing exhaust noise to a minimum; improves morale and workmanship; boosts productivity. Muffled motors are available on Airetool Vertical Grinder Models 600 VM and 700 VM for cup and depressed wheel grinding, sanding and wire wheel work.

Remember, too, Airetool makes both vertical and horizontal grinders to meet every grinding need. Our new Bulletin 70 gives facts and performance figures for all Airetool Grinders. Write for your copy today.

more than 30 years' experience in pneumatic tools

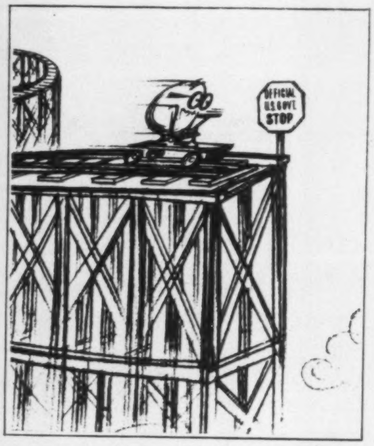
AIRETOOL
MANUFACTURING COMPANY
SPRINGFIELD OHIO

Branch Offices: New York, Chicago, Tulsa, Philadelphia, Houston, Baton Rouge
Representatives in principal cities of U.S.A., Canada, Mexico, Puerto Rico, South America, England, Europe, Italy, Japan, Hawaii
European Plant: Vlaardingen, The Netherlands
Canadian Plant: Brantford, Ontario

NEW BOOKS

"The Continuous Casting of Steel in Commercial Use," by K. P. Korotkov, N. P. Maiorov, A. A. Skvortsov and A. D. Akimenko. This book describes the designing, starting up and operation of a continuous casting plant at the Krasnoye Sormovo works in Russia. An appendix in the book gives temporary production process instructions, for the continuous casting of steel. 171 pp. About $7.00. Pergamon Press Ltd., Headington Hill Hall, Oxford, England.

"Strictly Birdmanship or: How to Lay the Egg That Kills the Golden Goose," by B. S. Benson. The author, head of Benson-Lehner Corp., describes in cartoon form some of the problems of a government contractor. "If your technical officer is in danger of understanding what you are doing, he must be moved on. . . ." or, "The higher the salary, the higher the fee is the key to development contracts . . . this also helps us resist the temptation to compete in world markets which might tend to offend our friends overseas." IA recommends: Buy one and send it to your congressman. Illustrated (see cut). 40 pp, $3.00. Benson-Lehner Corp., 1860 Franklin St., Santa Monica, Calif.



"Introduction to the Kinematic Geometry of Gear Teeth," by Allan H. Candee. Presented in the book are information and explanations about gear-tooth contact. The book's style of presentation makes it useful for reference and suitable for study. The book's scope is restricted to gears on parallel axes, with straight teeth parallel to the axes. None of the problems treated in the book is new. But, the solutions are obtained by thinking geometrically. 204 pp. $12.50 per copy. Chilton Co., Book Div., 56th & Chestnut Sts., Phila. 39.

"Noise Reduction," edited by Leo L. Beranek, is a guide on the theory and practice of noise reduction. The book clearly explains the fundamentals underlying noise and vibration control. In a logical fashion, it goes through the design and engineering of buildings, installations, industrial machinery and other projects. The book also covers materials applicable over a wide range of fields. The reader gains an understanding of acoustical problems in everyday situations. 752 pp, 399 illustrations. $14.50 each. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36.

"The Fermi Surface," edited by W. A. Harrison and M. B. Webb, contains the proceedings of an international conference on Fermi surfaces. The conference was held at Cooperstown, N. Y., in August of 1960. The book summarizes the progress of the last few years in the understanding of the electronic properties of metals. It also clarifies the current status of the science. In addition, the book defines the problems which still require solution. 356 pp. $10.00 per copy. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16.

"Power Transmission Design Directory" covers power transmission products and related products. The volume is ideal for engineers and buyers whose responsibilities include design, specification and maintenance of power transmission products. 700 pp. $12.00 each. Power Transmission Design Magazine, 812 Huron Rd., Cleveland 15.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Rotary Tables

Complete technical and application specifications, for high-precision rotary tables, are presented in a four-page catalog. Data are given on the various sizes of tables. (AA Gage Co.)

For free copy circle No. 1 on postcard

Motorized Drives

Gearmotors and coupled speed reducers are described in a six-page bulletin. Two full pages of selection tables tabulate various output speeds for each horsepower rating, in all three AGMA classes. (Howell Electric Motors Co.)

For free copy circle No. 2 on postcard

Cut-Off Machine

A bulletin describes a wet abrasive cutting machine. It is designed for cutting-off operations in steel mills, forge shops and other heavy industries. (American Chain & Cable Co., Inc.)

For free copy circle No. 3 on postcard

Power Presses

From 2-85 tons in capacity, a power press line is featured in a catalog. The company's automatic feed, for all press models, is also highlighted in the catalog. (Havir Mfg. Co.)

For free copy circle No. 4 on postcard

Refractory Insulation

Characteristics and qualities of refractory insulation material are described in a folder. Physical properties of the material and thermal conductivity data are included. (Kaiser Refractories & Chemical Div., Kaiser Aluminum & Chemical Sales, Inc.)

For free copy circle No. 5 on postcard

Numerical Control

Numerical control systems are presented in a 16-page brochure. Complete specification information is given for all units. (The Bendix Corp.)

For free copy circle No. 6 on postcard

Relays

A 16-page catalog shows a complete line of electro - magnetic relays. Engineering data on 42 different series of relays are included. Mounting data are also given. (Potter & Brumfield Div. of American Machine & Foundry Co.)

For free copy circle No. 7 on postcard

Metal Stampings

A file size catalog shows some of the company's contract manufacturing facilities. The various types of metal stampings and assemblies produced by them are also shown. (Waterbury Pressed Metal Co.)

For free copy circle No. 8 on postcard

Acetal Resin

The subject of a 23-page booklet is "Delrin" acetal resin. Included in the text are up-to-date tables and discussions on "Delrin." Properties, design considerations and forming technique are also given. (E. I. du Pont de Nemours and Co.)

For free copy circle No. 9 on postcard

Electric Trucks

A 12-page brochure illustrates how manufacturing techniques affect the value and performance of electric industrial trucks. The literature describes the series of machining and assembly operations which permits the trucks

---

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **2/2/61**

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

If you want more details on products advertised in this issue fill in below:

Page ....Product ....

Page ....Product ....

Page ....Product ....

INVALID WITHOUT COMPANY NAME AND TITLE
PLEASE TYPE OR PRINT

Name ....

Title ....

Product Manufactured ....

Company ....

Co. Address ....

....

City .... Zone .... State ....

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

BUSINESS REPLY MAIL
No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

BUSINESS REPLY MAIL
No postage necessary if mailed in the United States

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

POSTAGE WILL BE PAID BY

THE IRON AGE
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 2/2/61

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

If you want more details on products advertised in this issue fill in below:

Page .... Product ....
Page .... Product ....
Page .... Product ....

**INVALID WITHOUT COMPANY NAME AND TITLE
PLEASE TYPE OR PRINT**

Name ....
Title ....
Product Manufactured ....
Company ....
Co. Address ....
....
City .... Zone .... State ....

FREE LITERATURE

to be tailored to specific applications. (The Elwell-Parker Electric Co.)
For free copy circle No. 10 on postcard

Mixes Solid Propellants

Mixers, for processing solid propellants, are illustrated and described in a six-page bulletin. Detailed information is given on construction features. (The J. H. Day Co.)
For free copy circle No. 11 on postcard

Crushers

Horizontal saw tooth and vertical cone crushers are dealt with in a catalog. Full design and dimensional data are supplied for the crushers. Close-up photographs reveal saw tooth construction. (The Young Machinery Co., Inc.)
For free copy circle No. 12 on postcard

Blast Cleaning Barrels

Features found in a line of blast cleaning barrels are described in a 16-page booklet. Diagrams and photographs illustrate it well. Outlined case histories are included. (Pangborn Corp.)
For free copy circle No. 13 on postcard

Brazing Alloy

Described in a two-page data sheet is a nickel base brazing alloy. The alloy is used for joining stainless steel surfaces with large clearances. Its engineering and brazing properties are listed on the sheet. (Stainless Processing Div., Wall Colmonoy Corp.)
For free copy circle No. 14 on postcard

Dial Timer

The subject of a four-page bulletin is a push-button, automatic reset dial timer. The bulletin contains complete data on applications, construction, installation and specialized functions. (Automatic Timing & Controls, Inc.)
For free copy circle No. 15 on postcard

Foundry Belting

Eight different types of belting are described in a brochure. The belting is specially designed for foundry service. The literature details specific belting recommendations for nearly every belt usage and operating condition found in a foundry. (Imperial Belting Co.)
For free copy circle No. 16 on postcard

Instant-Action Vise

Tool room and production vises are fully described in a short bulletin. Specifications are included. (Harig Mfg. Corp.)
For free copy circle No. 17 on postcard

Screw Jacks

Worm gear screw jacks are dealt with in a technical bulletin. It covers speed/loading information, torque/horsepower requirements and selection data. (The Joyce-Cridland Co.)
For free copy circle No. 18 on postcard

Panel-Type Air Filters

The text and illustrations of a four-page bulletin describe the advantages of a panel-type air filter. Performance graphs and photo captions indicate characteristic and qualities of the filter fiber. (Union Carbide Development Co.)
For free copy circle No. 19 on postcard

Liquid Meters

Complete with meter specifications, a four-page circular describes and illustrates a stainless steel liquid meter. Features of the meter are discussed in the literature. (Neptune Meter Co.)
For free copy circle No. 20 on postcard

Heavy-Duty Detergent

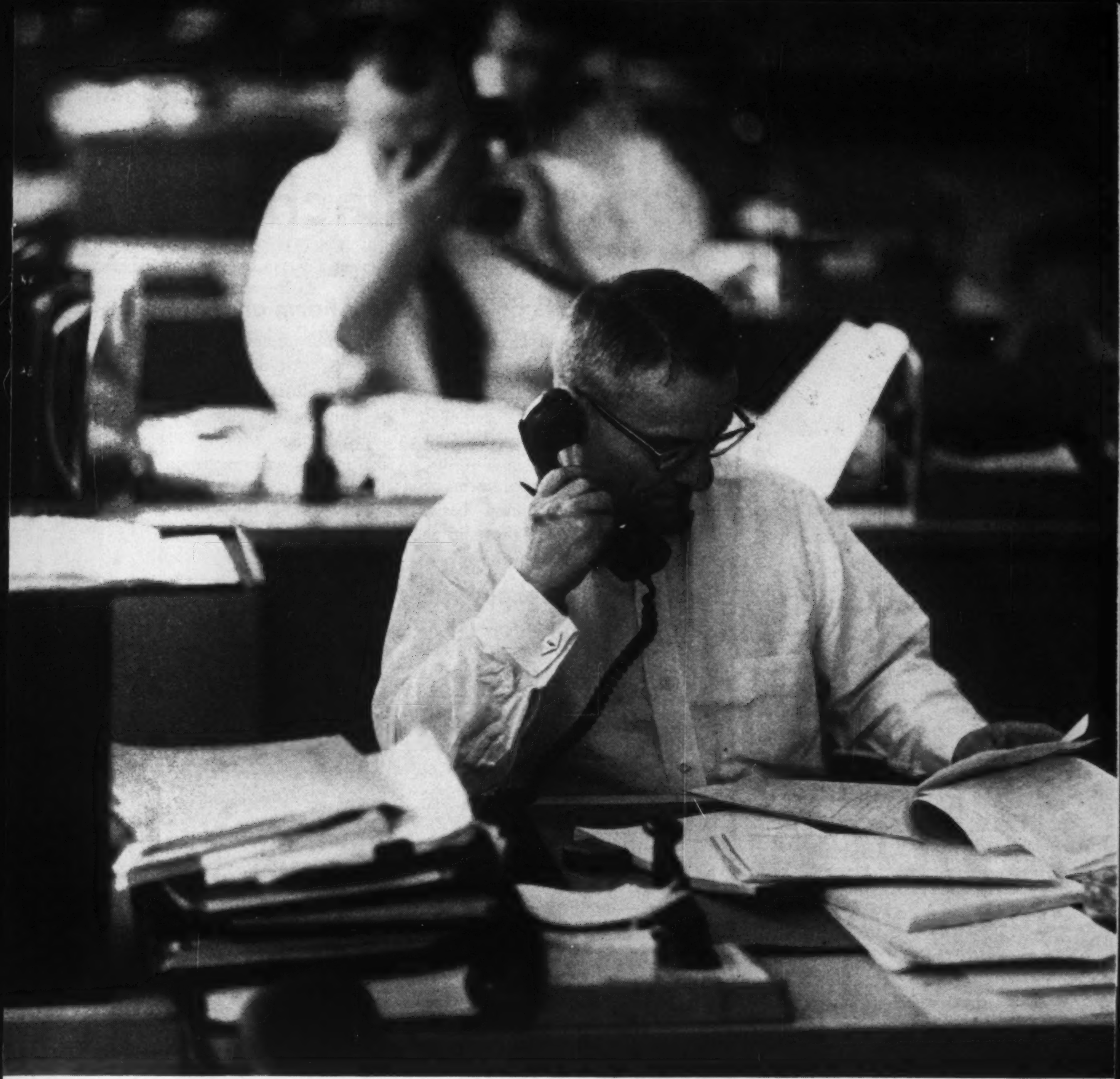
For really rugged cleaning jobs, a strongly alkaline cleaner is described in a bulletin. The cleaner may be used in the cleaning tank or in steam cleaning operations. (Oakite Products, Inc.)
For free copy circle No. 21 on postcard

Computer Chart

Cataloged in a fold-out chart are characteristics of 43 U. S.-built general-purpose, stored-program electronic digital computers. Computer listing is in order of decreasing rental. (Charles W. Adams Assoc., Inc.)
For free copy circle No. 22 on postcard

Valves

A 16-page bulletin describes and illustrates a line of corrosion-resistant valves. Cross-section illustrations of all valves are included. (Alloy Steel Products Co.)
For free copy circle No. 23 on postcard



Call Crucible for fast answers to tough questions

The inside account salesman is your direct line to Crucible's warehouse of technical know-how on special steels.

He can give you analyses, tempering times and temperatures, and even recommended speeds and feeds. He'll ask you intelligent questions. He may make suggestions. If he does, listen. His suggestions could help solve your problem.

Integrated staffs of steel experts back up the inside salesman. So if he can't answer your questions quickly, he can refer them to sales-service engineers *in his office* who specialize in tool steels, stainless and alloys. Or to *regional* customer technical service engineers whose specialties range from chemical engineering to welding and metallurgy. And even to *research metallurgists* at Crucible mills – many of whom are world-famous for their discoveries in metals.

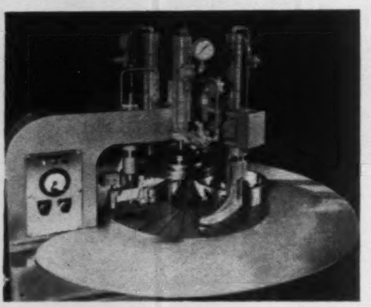
Ask about your Crucible steel center's many services the next time you talk to the inside salesman servicing your account. Or write: *Crucible Steel Company of America, Four Gateway Center, P. O. Box 88, Pittsburgh 30, Pa.*

CALL CRUCIBLE

— and ask to have your name added to the mailing list to receive local stock lists.

CRUCIBLE **STEEL COMPANY OF AMERICA**

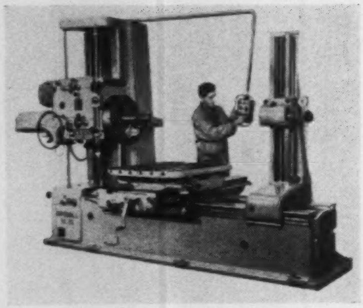
New Equipment and Machinery



Unit Laps Parts of Almost Any Form or Material

Compact in size, a lapping machine operates efficiently in a small space. A large, wrap-around adjustable table provides for rapid loading and unloading of parts, from almost any position. The machine laps parts of any shape, form or material on a production basis. Tolerances are of one light band or less. Uniform microinch finishes are 2 to 3. An abrasive distribution system maintains the correct mixture of compound to vehicle. It provides adjustable flow control. The system also insures uniform deposits at the lapping stations. (Crane Packing Co.)

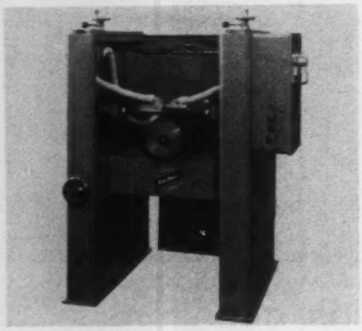
For more data circle No. 57 on postcard, p. 113



Boring Mill Incorporates Air-Flow Suspension

The table movement of a 3-in. bar horizontal boring, milling, drilling and turning machine, has no metal-to-metal contact. A minute film of air supports the longitudinal and cross travel of the saddle and table. A built-in air-oil compressor supplies this film of air. The volume of air required is small. The pressure required is very low. Both the table and saddle give smooth traverse. This applies for feed and rapid return. With no metal-to-metal contact, wear is completely eliminated. The unit also has hydraulic clamping of head, table and outboard. (S & S Machinery Co.)

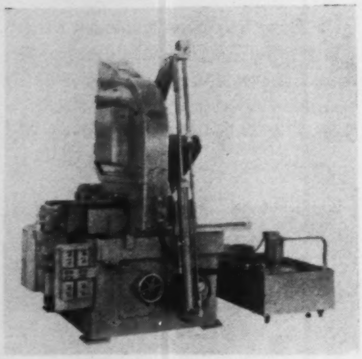
For more data circle No. 58 on postcard, p. 113



Machine Deburrs Both Ends of Gear Teeth

One revolution deburrs both sides of a gear at the same time. A deburring machine does this with two floating arms. Precise indexing of the gears on the spindle is unnecessary. A friction-type clamp holds the gear in place. Depressing the spindle start button begins the rotation of the spindle. Depressing the cycle start button actuates the grinding heads. They lower automatically. Deburring begins. On completion of one revolution, the machine automatically resets for the next cycle. Protractors on the machine indicate tilt and head angle position. Housings over grinding wheels are the intake for the exhaust system. (Davis & Thompson Co.)

For more data circle No. 59 on postcard, p. 113



Machine Cuts Mild Steel, Space-Age Metals

Forge shops and steel mills find this wet abrasive cut-off machine to provide a fast means of cutting most materials. Most materials include—from mild steel to modern space age metals. A 50-hp motor powers the machine. A 34-in. diam abrasive cutting wheel cuts solids, tubing and structurals. Cutting rate is 7-10 sq in. per minute. Length of oscillation stroke is adjustable. Oscillation of the cutting wheel reduces the arc of contact between wheel and work. It permits coolant to enter the cut more freely. This results in faster cutting, better cutting quality and longer wheel life. A calibrated work stop adjusts for cutting lengths up to 24 in. All motor switches are protected against overload. (Allison - Campbell)

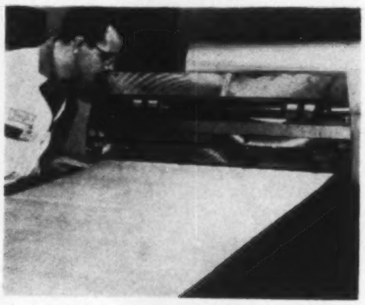
For more data circle No. 60 on postcard, p. 113

Impact Wrench

Loosening tightly embedded nuts and bolts is a costly, laborious chore. A manual impact wrench does away with all of this. It builds up power in a strong spring and releases a wallop of twisting impact. This happens every time the handle moves more than 30 degrees. Critical parts of the wrench are made of rugged alloy steels. This insures long life and low maintenance. (Marquette Div., Curtiss-Wright Corp.)

For more data circle No. 61 on postcard, p. 113

Machine Pleats Filters



Metal and other filter materials are folded into corrugated shapes by a new machine. Cam-controlled action moves the forming dies in both the horizontal and vertical planes. The folding machine can, at the same time, pleat and laminate different materials. These include steel, copper, brass, aluminum, cloth, felt and paper. Pleated materials provide effective filtering within a limited dimension. (Twin Coach Co.)

For more data circle No. 62 on postcard, p. 113

Automatic Ladle

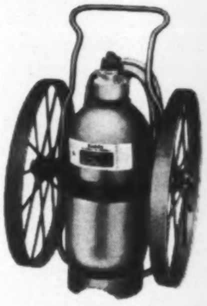
For die or permanent mold casting, an automatic ladle delivers clean metal to the cold chamber quickly, accurately and dependably. Bottom entry and cover provide sub-surface fill. This minimizes oxide inclusions and hydrogen absorption. All surfaces in contact with the metal are covered with a special non-wetting ceramic. The discharge tube is gas infrared heated to prevent temperature loss. A complete electrical control system integrates ladle operations with the

NOW! GET FULL-POWER FIRE FIGHTING WITH KIDDE'S DRY CHEMICAL LINE!

2½ and 5 pound pressurized units! Granted top rating by U.L., these two units pack the extra punch needed to get the jump on fire. For example, the 2½ pound Kidde unit is as compact as a 1 quart carbon tet model, yet is eight times as powerful! Both the 2½ and 5 feature simple, two-step operation, easy-to-read dust-and-moisture-proof gauges. 10 pound dry chemical also available.

Kidde
REMOVE HORN PULL TRIGGER
REMOVE HORN PULL TRIGGER

20 and 30 pound pressurized dry chemicals! Both these Kidde units have the same good features of the 2½ and 5, plus some "extras" all their own. Center balanced for fast action, rugged diffuser horn, speedy trigger operation, recessed pressure gauge and enclosed mechanism.



200 pound dry chemical wheeled unit! Kidde's 200 pounder discharges a 40-foot stream faster, has an *extra* 50 pounds of fire-smothering dry chemical to knock down fire quicker. Low center of gravity and wide wheels make it easy to maneuver. Easy-to-use discharge control makes operation simple.

400 pound stationary unit! Here's maximum protection in a minimum package! Like all Kidde units, this features sure, dependable performance and fast, easy operation. Either wall-mounted or free standing, leakproof and tamperproof, exclusive Bridgeman Seal, universal long-range nozzle, easy-to-read pressure gauge. 200 pound model also available.

Get the jump on oil, gas and electrical fires! Learn more about the complete line of dependable, efficient Kidde equipment—write today!

Kidde

Industrial and Marine Division
Walter Kidde & Company, Inc.
249 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal—Toronto—Vancouver

NEED TUBING?

We have it in stock!

CA R

More than 2500 sizes, shapes and grades of steel and aluminum tubing are carried in our stocks available for immediate shipment.

In addition we can furnish mill quantities of tubular items for standard and special applications.

- **Seamless and Electric Welded**
- **Cold Drawn Butt Welded**
- **Hydraulic Pressure Tubing**
- **Squares and Rectangles**
- **Stainless Tubing and Pipe**
- **Stainless Fittings and Valves**
- **Stainless Aircraft Tubing**
- **Aluminum Tube and Holobar**
- **Aluminum Pipe and Fittings**

Write Dept. I-2 for stock list

C. A. ROBERTS CO.
Steel & Aluminum Tube Specialists
2401 25th St., Franklin Park, Ill., GLadstone 5-6400

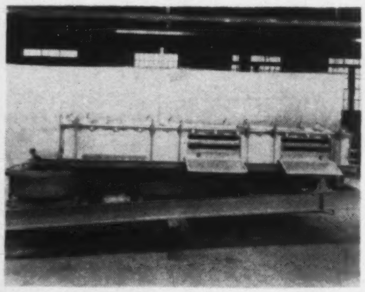
6 warehouses serving the middlewest
CHICAGO • DETROIT • INDIANAPOLIS
ST. LOUIS • TULSA • N. KANSAS CITY

machine. A safety cancel feature automatically prevents metal pour if the dies do not lock up. (J. A. Kozma Co.)

For more data circle No. 63 on postcard, p. 113

Machine Cools, Sifts

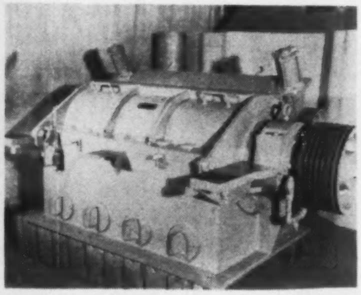
At times, space and time requirements demand cooling and sifting at the same time. Cooling as it sifts, a machine answers this need. The feed inlet of the machine has gyratory motion. This provides maximum contact on the cooler coils. The slight slope and oscillating motion at the discharge end gives continuous flow to the material. Special thermo coils, formed on the underside of the flat "pan" accomplishes cooling. They use a continuous flow of cold water or brine to carry away the heat from the product. Besides cooling and sifting, the machine can also sift and cool. (The Young Machinery Co.)



For more data circle No. 64 on postcard, p. 113

Rotary Knife Cutter

Forty-eight inch wide film sheet is no stranger to this rotary knife cutter. Its design is primarily for the granulating of roll fed scrap or sheets. They can be as thin as one thousandth of an inch. The machine provides very accurate knife clearances. They can be held to within three thousandths of an inch. Rotor cutting circle is 20 in. in diam. Rotating knives are "shear cut." They insert in the rotor and firmly wedge-lock in position. (Sprout, Waldron & Co., Inc.)



For more data circle No. 65 on postcard, p. 113

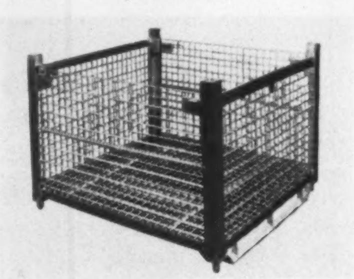
Portable Conveyor

Never needing lubrication, a portable belt conveyor travels forward or reverse at 65 fpm. The "greaseless" conveyor is made possible through the use of a new sealed bearing device that needs no lubrication. The conveyor has a 10-in. belt on a 12-in. bed made of 12 heat-treated aluminum with steel ends and welded steel frame. (Hytrol Conveyor Co.)

For more data circle No. 66 on postcard, p. 113

Heavy-Duty Container

The prime feature of a heavy-duty wire container is its ability for stacking. In this way, it saves valuable floor space. The container boasts a holding capacity of 6000 lb. Its construction provides a visible inventory and makes it self-cleaning. The base of the container permits easy access for fork trucks and cranes. This hastens the movement of parts and materials. With or without drop sides, it comes in two sizes: 48 x 53 x 38 in. and 42 x 53 x 38 in. (Springport Steel Products Co.)



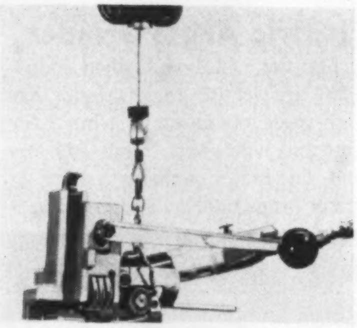
For more data circle No. 67 on postcard, p. 113

Guide Line Light

To be used in small areas or low-ceilinged plants, a light casts clear, sharp shadow lines for cutting, marking or assembly operations. The guide line light uses a special 500-w lamp, less than ⅜-in. diam. It will burn about 2000 hours without forming carbon deposits. A special reflector increases the lumen output to give unusually clear marking lines. The light will project any desired number of parallel straight lines in a pattern 8-16 in. wide and 4-8 ft long. (Carter Products Co., Inc.)

For more data circle No. 68 on postcard, p. 113

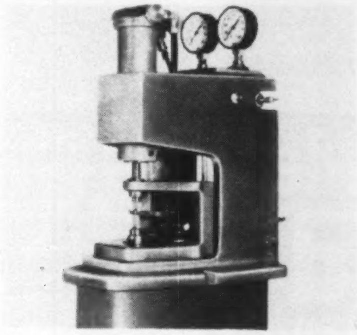
Stretcher-Sealer



In less than a second, a lightweight stretcher - sealer tensions, seals and scores strap. Loading the air tool is done quickly. The two straps easily funnel into position at the same time. Releasing a lever on the unit immediately drops the drive wheel into position. The unit weighs less than 13 lb. It works well in all horizontal and vertical positions. A suspension hook located at the tool's center of balance makes it easy to suspend the tool from a balancer. (A. J. Gerrard & Co.)

For more data circle No. 69 on postcard, p. 113

Unit Presses, Stakes

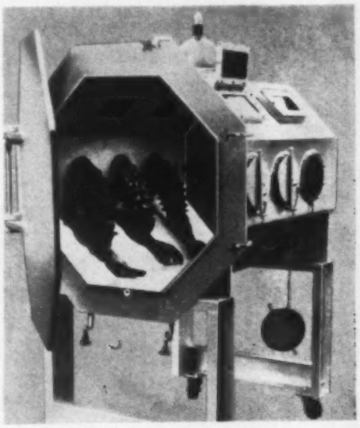


One high-speed, fully-automatic assembly tool combines a press-stake-eject cycle. Independent pressing and staking forces adjust from lightest tap to 1 ton. Automatic, adjustable ejector removes finished assemblies. Standard interchangeable tooling fits removable "C-holder" die set. This adapts to wide variety of assembly operations. (Cramer Controls Corp.)

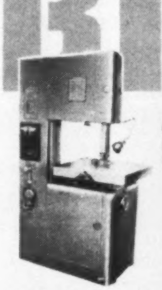
For more data circle No. 70 on postcard, p. 113

Atmosphere Room

Set on wheels, a vacuum dry box provides for working in a rare gas.



It can also be used for inert atmosphere welding or with explosive and hazardous materials. The



FLEXIBLE

Model 87 20" Metal Cutting Band Saw

NEW, COMPLETE POWERMATIC CATALOG!
SEND FOR YOUR FREE COPY TODAY

DIAL YOUR SPEED AND CUT YOUR COST . . . SAFELY

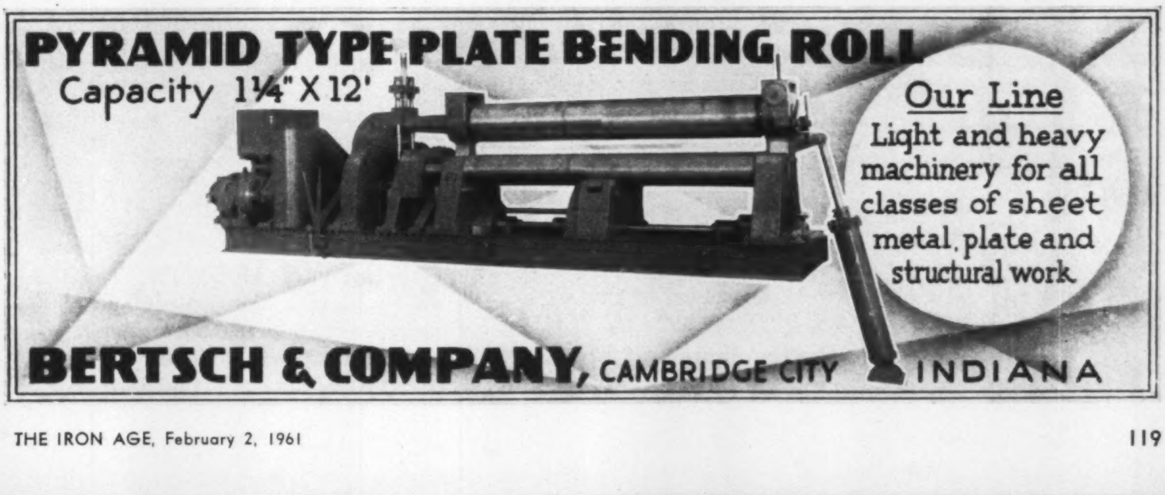
Set your speed from 10 to 4600 SFM instantly . . . while machine is running!

See how much you save in speed change-over time as you switch from one stock to another instantly . . . ferrous and non-ferrous metals, wood, plastic and similar materials.

Dealers in Principal Cities

POWERMATIC®
MACHINE COMPANY Dept. 6
McMinnville, Tennessee

BAND SAWS DRILL PRESSES GRINDERS



PYRAMID TYPE PLATE BENDING ROLL
Capacity 1¼" X 12'

Our Line
Light and heavy machinery for all classes of sheet metal, plate and structural work

BERTSCH & COMPANY, CAMBRIDGE CITY INDIANA

box can be evacuated to 50 microns, with a leak rate of 1 micron per minute. Because of its unusual shape, several people can work at the same time. (Controlled Atmosphere Enclosures Mfg. Co.)

For more data circle No. 71 on postcard, p. 113

Straddle Truck

This weight lifter picks up and carries 60,000-lb loads between its wheels. The machine itself weighs about 17 tons. It can lift bulk in a maximum size of 75-in. high by 60-in. wide The truck can also place several loads of steel on a heavy-duty bolster, pick up the bolster and carry it to a particular place. Thus, it makes several trips in one. (Hyster Co.)

For more data circle No. 72 on postcard, p. 113

Turret Drills

Three-axis, tape-controlled turret drills provide automatic depth control. The new design of the units speeds setting up a job. It eliminates manual pre-setting of mechanical depth stops. The same spindle can be used to automatically machine holes of varying depths, at different work positions. This is done by programming the rapid approach length and depth of each cut into the punched tape. (Burg Tool Mfg. Co.)

For more data circle No. 73 on postcard, p. 113

any hardened way you can design

THE OHIO KNIFE CO. CAN MAKE

BETTER — our time proven process of bonding special analysis tool steel to tough machineable steel, then hardening the tool steel (65-66 Rockwell C) along entire length, enables us to give you hardened surfaces anywhere you want them.

FASTER — we make hundreds of these special shapes for every conceivable application—our new production methods are geared to meet fast delivery requirements.

LOWER-IN-PRICE — no one is as completely set-up — design, engineering, heat treating and production—to deliver these special ways to you at a price far below what it would cost you to make them yourself.

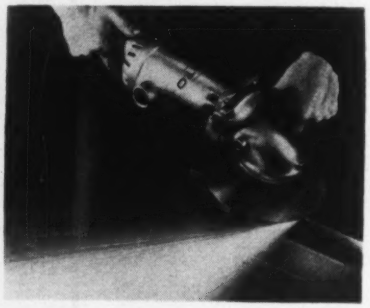
IMPORTANT — we carry in hardened stock 12 standard way shapes in 88 sizes, with delivery from stock to 5 weeks.

For FREE Bulletin-A, describing O-KNI-CO hardened ways, wear plates, etc., write Dept. 122-FF

THE OHIO KNIFE CO.
CINCINNATI 23, OHIO

Electric Angle Grinder

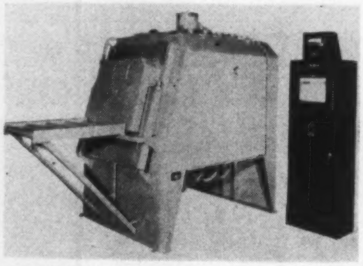
For the metal and allied industries, an electric angle grinder has high-speed operation. It trims castings and cuts risers, removes burrs and eliminates welding seams or minor projections on bodies or chassis. A 1.6-hp motor drives the grinder. Speed at no load is 6500 rpm. The grinder accommodates highly-flexible, resin-bonded and depressed-center grinding disks. (Victor J. Krieg, Inc.)



For more data circle No. 74 on postcard, p. 113

Box Furnaces

A line of controlled-atmosphere box furnaces consists of large and small units. The smaller units maintain temperatures of 2400°F. The larger units are capable of temperatures to 2250°F. Since the charge is heated by 100-pct forced convection, the units maintain good temperature uniformity. The furnaces come as gas fired, oil fired or



electrically-heated units. They can be manually charged or used with mechanized loaders and unloaders. The latter use is for production-line heat treating operations. (Ipsen Industries, Inc.)

For more data circle No. 75 on postcard, p. 113

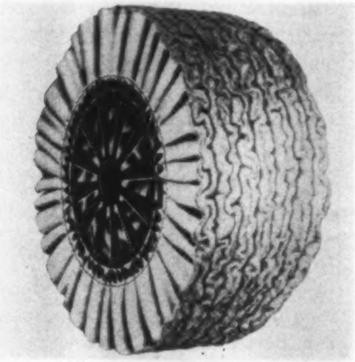
Compressor

Foot mounted on bonded rubber, a two-stage, single-acting compressor eliminates foundation costs. It is ideal for permanent installations and on temporary job sites. The unit features total air cooling. Use of light weight metal alloy for many parts gives the compressor an outstanding capacity to weight ratio. The unit delivers from 115-141 cu ft of air per minute at pressures ranging up to 125 psi. (Atlas Copco)

For more data circle No. 76 on postcard, p. 113

Cloth Bias Buffs

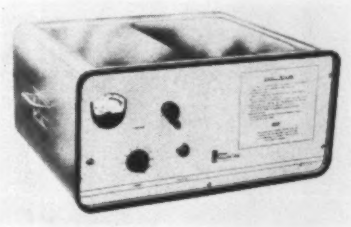
A slight yellow coloring on the manufacturer's cloth bias buffs means flame-protection. Buffs having the yellow flameproof treatment cannot ignite, even when directly exposed to fire. This treatment is ideal for cloth buffs used in high-speed lathe operations. Buffs constantly build up heat due to long periods of contact with work. According to user's reports, the treatment to the buffs extends their life and gives better compound retention. (American Buff Co.)



For more data circle No. 77 on postcard, p. 113

Ultrasonic Cleaner

Both the generator and cleaning tank, of an ultrasonic cleaner, take shelter in a one-piece, wrap-around cabinet. It is polished stainless steel. The 250-w unit requires minimum controls. A basket of cleaned parts may be stored on the top area next to the cleaning tank. This top area is recessed to prevent any liquid from draining over the side. The cleaner measures 25-in. wide, 11-in. high and 18-in. deep. The cleaning compartment measures 10-in. long, 14-in. wide and 6-in. high. (National Ultrasonic Corp.)



For more data circle No. 78 on postcard, p. 113

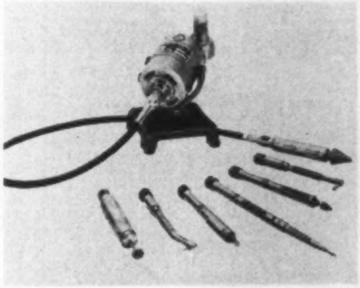
Determines Moisture

A handy little instrument obtains the relative humidity of samples of grainy or powdered materials. It consists of two parts. A calibrated hygrometer fits into the top of an oxidized aluminum container. The container holds the material to be tested. The hygrometer indicates the relative humidity of the sample. Each instrument includes a table of humidity equilibrium. Knowing the relative humidity, it is then possible to determine the percentage of absolute moisture by consulting the table. (Abrax Instrument Corp.)

For more data circle No. 79 on postcard, p. 113

Versatile Power Tools

A miniature power tool does a man-size job. A wide selection of the company's pencil-slim and miniature angle-type handpieces are quickly interchangeable. They accept rotary tools of all kinds with shanks from 1/32 to ¼ in. In



This is how you read
1 oz. on
ordinary
scales

This is how
you read
1 oz.

ON DETECTO
OVER-UNDER SCALES

Big 'travel' magnifies slightest weight discrepancy . . . prevents your profits dribbling away, ounce by ounce. Send for specifications.

DETECTO SCALES INC.
Dept. W-2,
540 Park Ave., Brooklyn 5, N. Y.

WARD
For Countless Uses
of
SPRING
STEEL

AMERICA'S LEADING SUPPLIER
Where
SERVICE and QUALITY
is the rule

WARD
STEEL
CO.

Boston—Cambridge, Mass
Chicago, Ill.—Greensboro, N. C.

HOW TO BEAT THE HEAT

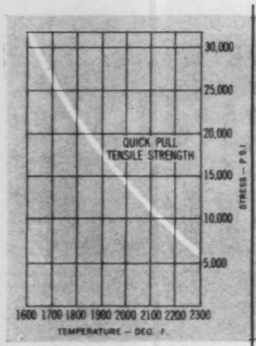
for strong high alloy requirements in the 1,800° to 2,300° F range!

DURALOY HOM*

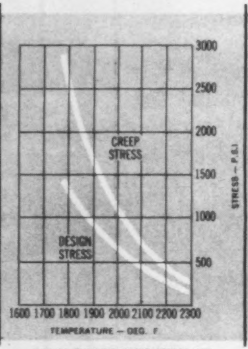
*Covered by U.S. Patents

casting alloy

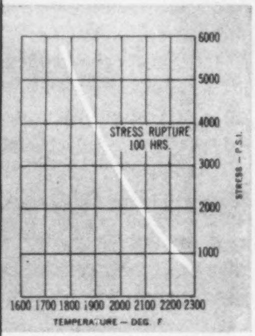
Duraloy "HOM" is a special high nickel alloy developed to produce castings that meet high temperature requirements, especially when castings are subject to oxidizing atmospheres.



CURVES SHOWING HIGH TEMPERATURE SHORT-TIME TENSILE STRENGTH OF DURALOY-HOM



CURVES SHOWING CREEP STRESS FOR CREEP RATE OF 1% IN 10,000 HOURS AND RECOMMENDED DESIGN STRESS FOR DURALOY-HOM



CURVE SHOWING STRESS TO RUPTURE AT 100 HOURS FOR DURALOY-HOM

Castings of DURALOY "HOM" are now being produced by our three methods: static, centrifugal and shell molded. Write today for additional information on this versatile new alloy.

ALLOY CASTING INSTITUTE
ACI
MEMBER

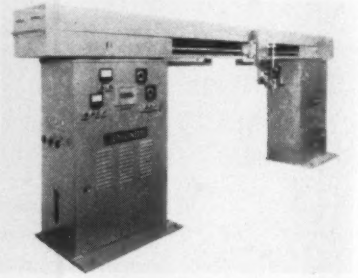
The DURALOY Company
OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23908 Woodward Avenue, Pleasant Ridge, Mich.

many cases, this unit will take the place of bulky power tools. The unit proves to be quite valuable for grinding, drilling, polishing, deburring and marking. Lightness of the handpieces allows single-hand operation. (Foredom Electric Co.)

For more data circle No. 80 on postcard, p. 113

Hydraulic Traverses

Electronically controlled, hydraulic traverses provide reciprocating linear motion. Velocity is uniform. Maximum length of stroke ranges from 48-144 in., depending on the model. The length and position of stroke is infinitely adjustable. Direct-reading counters indicate the position, length and speed of stroke. Speed of stroke adjusts from 0-240 fpm. Dwell at the end of each stroke can be controlled. Speed and length of stroke are adjustable during operation. (Jennings Machine Corp.)



For more data circle No. 81 on postcard, p. 113

Convertible Band Saw

A compact, convertible band saw has a dual purpose. It can be used as a horizontal cut-off saw or as an upright band saw for cutting angles, slots, notches and bevels. Maximum horizontal cutting capacity is 3½ x 6 in. for rectangular shapes, 3½-in. diam for rounds. The saw finds its power in a ¼-hp, 115-v motor with "V" belt drive. It offers selective blade speeds of 54, 100 and 190 fpm. A positive screw action vise holds stock for horizontal cut-off work. To convert to a vertical saw, the head swings into a vertical position. (Wells Mfg. Corp.)

For more data circle No. 82 on postcard, p. 113

Appliances Offset Auto Cutbacks

Severe cutbacks in automotive orders continue. But the steel product buying picture is changing.

A pickup in orders from appliance makers, along with low inventories, are the biggest factors now working for the steel industry.

▪ The steel market is undergoing a basic change in product and customer demand. First quarter business will not show much of a tonnage change from the last months of 1960. But the product picture is undergoing a basic shift.

Basically, severe cutbacks in automotive orders are counter-balanced by a strong swell of orders from a wide range of steel users for a wide range of products.

Inventory Picture—The lack of any pattern in new orders and the fact that a large percentage of new business is on the rush basis, indicate most steel users have very low stocks of steel.

In the face of disappointing auto sales and the hesitant state of business, low inventories may be the biggest single factor working for the steel industry.

The Factors—These are some of the new factors in the market:

Tinplate orders are starting to move a little faster. But there's a negative factor in assessing effects on production. Some mills are absorbing the new orders from mill stocks carried over from last year. Galvanized is also showing a seasonal pickup.

Warehouses, appliance makers, plus some general demand, have stepped into the sheet market. Here, again, lack of lead time makes it difficult to measure their staying power when compared against auto cutbacks.

Oil country seamless and standard pipe had a January pickup and inventory rebuilding here is a factor.

Weakest Show Strength—It's noted that products that have been weakest, such as bar and plate, are now showing the greatest relative gains. In contrast, automotive slowdowns have hit the cold-rolled sheet market.

Meanwhile, the auto picture changes daily. Layoffs, production cuts, steel order setbacks, cancellations, and also demands for quick steel delivery, all contribute to the confusion.

Automotive Rundown—At the moment, General Motors divisions are carrying the automotive steel ball. Ford's January-April buy just about equals four-fifths of its original order. This means that almost a full month has been lopped off. Chrysler's March tonnage, to date, is very low.

Watch Appliances—Auto production so far in 1961 is lagging almost 50 pct behind 1960. New car inventories at the start of the year were about a 53-day supply. They may have gone up since, despite cutbacks in production.

In spite of the new show of all-around strength, the feeling is that no major step toward recovery can materialize without a pickup in automotive orders.

The most encouraging note in the steel market (other than inventories) is the pickup in orders from appliance makers. It's too early to assess whether this is a false start, but new orders for sheet and enameling iron from appliance makers have shown encouraging strength.

District Steel Production Indexes 1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	77	82	52	148
Buffalo	73	73	54	158
Pittsburgh	69	70	49	147
Youngstown	76	76	38	159
Cleveland	73	77	52	169
Detroit	99	102	68	132
Chicago	84	87	75	141
Cincinnati	88	87	72	144
St. Louis	80	85	57	136
Southern	80	80	65	134
Western	84	84	81	133
U. S. Index	78.7	80.5	59.2	145.8

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	1,466	1,499	5,808	10,886
Ingot Index				
(1957-59=100)	78.7	80.5	77.9	146.1
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel, base (cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.32	$66.41
Scrap No. 1 hvy (Gross ton)	$31.83	$31.50	$29.17	$42.17
No. 2 bundles	$22.50	$22.17	$19.17	$28.17

Job of Office Buyer Grows

Office Buyers Group of the National Assn. of Purchasing Agents is one source of help for buyers of office needs.

The chairman of this group offers some pointers when buying office furniture.

- Buying for the office is becoming more and more a big and complex job. More specialists are appearing in office buying ranks. Office managers and buyers are in general agreement on the "why" behind this trend.

Industry is still burdened with increasing paperwork. More office workers are being used to handle the paper, and these workers are using more, and a greater variety of, equipment.

Buyers Group—Confirming this trend is the existence of the Office Buyers Group within the National Assn. of Purchasing Agents. This group, with about 1000 members, is one of the largest and most active within the national purchasing body. It is often thought that this group is made up entirely of buyers from the insurance, banking and other non-manufacturing fields. But according to Robert F. Ames, chairman of the group, about 40 pct of the members are from industry.

Mr. Ames, himself, is a purchasing representative of United States Steel Corp.

The NAPA Office Buyers Group conducts seminars during the year for buyers throughout the country. A little-known fact: The group runs day-and-a-half seminars for buyers and others outside the NAPA, as well as for members. These seminars are popular and well-attended, says Mr. Ames, because there are a great number of buyers in industry who are not specialists and realize the problem of buying for expanding office operations.

Mr. Ames, with his staff in New York, buys office equipment and supplies for the eastern district of U. S. Steel. The IRON AGE asked Mr. Ames for some pointers on buying office furniture.

Furniture a Tool—He emphasizes that buyers of office furniture must realize they are buying a working tool. He points out that office furniture is in use 250 working days a year. Desk drawers are operated 20 to 30 times a day. And chairs are occupied 1500 hours a year. This means office furniture must be selected for durability and reliability just as the case of selecting production machinery or components.

In buying a desk, Mr. Ames says the "most important single area is in its moving parts." He suggests testing for quiet and easy operation of drawers. At the same time it should be noted, in a metal desk, whether or not the drawer has nylon glides and guides. These make for quiet operation. Mr. Ames cites durability and versatility as two of the factors that have pushed metal desks to the fore.

Desk Finish—There are three important points to consider in the finish of a desk, says Mr. Ames. "The finish on wood or metal should be chip-proof, easily cleaned or repaired, and be appealing.

He notes: "Accompanying chairs must be equally and carefully considered. Their acceptability by users can be determined by the amount of time the employees are away from their desks on 'rest' periods."

Office of the Future

Here are some of the changes that will shape the office of the future as visualized by Robert F. Ames, chairman of the Office Buyers Group of the National Assn. of Purchasing Agents. These advances will call for more specialized buying knowledge on the part of purchasing agents. The rapid growth of the 1000-plus membership of the Office Buyers Group is an indication that more buyers are looking for the specialized knowledge to do a better office buying job.

"We will soon be **dictating directly on to stationery** via a machine that can spell correctly and knows its grammar.

"Files will display screens mounted on desks or walls. Duplicating machines will do the job without ink or chemicals. Automatic typewriters will become more and more prevalent, and dictation will be to a centralized location.

"Computers will become more flexible and available to the small business man. Card-to-card transmission of data over long-distance telephone wires is now here.

"Improvements in **magnetic tape transmission** will follow in rapid succession, and there will be a much wider use of magnetic ink character recognition systems."

a continent
of manufacturers*
and markets**
in the palm
of your
hand

when you visit the
HANOVER INTERNATIONAL FAIR
Hanover, West Germany
April 30 - May 9, 1961

Annual Attendance: Over 1,000,000
buyers and businessmen
Exhibit area: 5,000,000 sq. ft.

INDUSTRIAL PRODUCTS: Mechanical and Electrical Engineering—Nuclear Energy—Electronics—Iron and Steel Transportation — Woodworking Machinery — Chemistry—Rubber and Plastics Processing—Textile Machinery—Precision Instruments—Office Equipment, etc.

CONSUMER GOODS: Porcelain—Ceramics—Glass—Jewelry and Silverware—Watches and Clocks—Radio, TV and Phonograph Equipment—Photographic Equipment—Electrical Appliances, etc.

**5,000 of the world's finest.*

***Buyers from every country of Europe, from Africa, Asia and Latin America.*

Free fact-filled brochures, visitor and exhibitor information, tickets and room reservations forms available from

GERMAN AMERICAN CHAMBER OF COMMERCE
666 Fifth Avenue New York 19, N. Y.

Let SUN SHIP solve your machine problem

When you need machine work or specially built machinery of any kind, you'll find Sun Ship qualified to do the job exactly to your specifications. We have machine tools of every size, and the facilities and skills born of long experience.

When you have a machining problem, write or phone

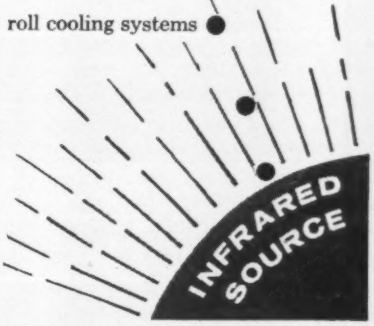
SALES ENGINEERING DEPARTMENT
Sun SHIPBUILDING &
DRY DOCK COMPANY
CHESTER, PA.

EUCLID SEN-TEK

SEN-TEK CONTROL
DETECTOR
POWER SUPPLY
CONTROL SYSTEM

POSITIVE
ACTUATION
from
INFRARED
RADIATION

- water descalers
- transfer operations
- coil upenders
- hydro jet descalers
- colloidal graphite spray systems
- roll cooling systems



WHAT'S YOUR PROBLEM?
Write for Bulletin E-300

The EUCLID Electric & Mfg. Co.
Dept. B • MADISON • OHIO

Buyers Fish For Price Concessions

Steel prices are caught in a tug-of-war between customers and the producers.

Buyers want fast delivery, which boosts costs, but hint they also want price shaving.

■ Steel prices are taking a working over such as they haven't had in a long time.

Steel buyers are still in the driver's seat—and they know it. Some users are fishing for price concessions. At the same time, their buying practices boost the cost of making steel.

Some tricks—Here are some of the things that are happening:

On receiving an order of steel a customer will complain to the mill that it isn't up to the quality ordered. He knows the mill doesn't want to haul it back. Actually, the buyer is after a price reduction.

Rather than bite, an eastern mill took back a fairly big order, replaced it with just-rolled steel.

Another approach: The customer asks the mill for a quote, then points out that another mill's price is lower. The product and tonnage may be identical, but the customer conveniently "forgot" to include all of the information—such as the fact that the lower quote doesn't include some extra or other charge.

Delivery Pinch — Mills are also being pinched by the "rush delivery" order. Users are still buying on delivery. If the customer demands 10-day delivery, mills often must change rolls to make the order. This involves extra downtime; this, in turn, boosts costs.

Follow-ups to lost orders often indicate the customers don't always need delivery as quickly as they have requested. Some mills are turning down this kind of business, but others can't afford to pass it over.

Bars — High-strength reinforcing bars are being given an all-out push by the steel industry to counteract deep inroads by foreign producers into the re-bar market.

They're being used for critical work at missile bases and on other new construction—as a step between regular re-bars and prestressed concrete. The high-strength bars have ratings up to 90,000 psi minimum yield. This compares to normal strengths of about 60,000 psi.

So far, foreign producers haven't been able to compete effectively. Nor have all U. S. mills. But the U. S. mills in the market get the higher tensile strengths by starting with large ingots. These are worked down to size by successive passes which increase strength in a manner similar to forging. Foreign mills and most other low-cost producers cast ingots only slightly over the final size so that minimum rolling is necessary.

From the users' standpoint, high-strength reinforcing bars cost more. But they also permit cutting the size of columns in buildings by about 34 pct. This increases rentable area for the life of the building.

Sheet and Strip—Automotive cutbacks have hurt **East Coast** mill bookings for hot- and cold-rolled sheet and strip. The result is the same everywhere. It's just the timing that's different. Some **Pittsburgh** mills will feel the slashes in the middle of February, others not until March. The word is less than encouraging from **Detroit,** where auto production schedules are undergoing almost daily revision. Mills don't expect much in the way of business from automotive parts suppliers clustered around **Chicago.**

Stainless and Specialties — Demand is moving through a series of ragged ups and downs. After a relatively good December, they fell in the first part of January, according to some **Pittsburgh** producers. Now, demand has revived. A puzzling aspect from **Detroit:** Automotive demand for stainless strip is showing no letdown. Inventory cutting by general users seems to be coming to an end also: Number of orders is rising without a sharp change in total volume.

Vacuum melting facilities at one **Pittsburgh** mill have been loaded by heavy new orders for missile steels. Fabricators are asking for three-to-four week delivery, indicating inventories are down in the defense field as well as elsewhere.

Pig Iron—Foundries are buying little pig. Instead, they are using scrap as a charge. One **East Coast** producer dropped its price on one low phos grade in order to get what local business there is.

Tinplate—National Steel Corp.'s double-reduced tinplate, being produced by the Weirton Steel Div., will be marketed under the brand name of "Weirlite." It will also be made by Midwest Steel Div.

PURCHASING AGENT'S CHECKLIST

New incentive plans and sound cost controls help hold down maintenance expenses. P. 56

Dow Chemical hopes pricing formula for alloy will stimulate magnesium sales. P. 58

Outlook for machine tool sales depends on government's tax policies, says one of the industry's executives. P. 73

COMPARISON OF PRICES

(Effective January 30, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Jan. 30 1961	Jan. 23 1961	Dec. 27 1960	Feb. 2 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	13.55
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchants bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wires: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slags, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Jan. 30 1961	Jan. 23 1961	Dec. 27 1960	Feb. 2 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.11	$70.57
Foundry, South Cin'ti	71.92	71.92	71.92	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.11	70.11	69.61	70.07
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb.‡	11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig iron	$66.44	$66.44	$66.32	$66.41
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$30.50*	$29.50	$27.50	$44.50
No. 1 steel, Phila. area	35.50	35.50	33.50	41.50
No. 1 steel, Chicago	29.50	29.50	26.50	40.50
No. 1 bundles, Detroit	26.50	26.50	23.50	41.50
Low phos., Youngstown	34.50	34.50	29.50	48.50
No. 1 mach'y cast, Pittsburgh	44.50	44.50	44.50	55.50
No. 1 mach'y cast, Phila.	48.50	48.50	47.50	54.50
No. 1 mach'y cast, Chicago	45.50	45.50	42.50	61.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$31.83*	$31.50	$29.17	$42.17
No. 2 bundles	22.50*	22.17	19.17	28.17
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.00	29.00	30.00	33.00
Copper, Lake, Conn.	29.00	29.00	30.00	33.00
Tin, Straits, N. Y.	100.50†	100.50	101.50	100.50
Zinc, East St. Louis	11.50	11.50	12.50	13.00
Lead, St. Louis	11.00	11.00	11.00	11.80
Aluminum, ingot	26.00	26.00	26.00	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. ** Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

INDEX TO PRICE PAGES

Prices At a Glance 123
Comparison of Prices 127
Bars 136
Billets, Blooms and Slabs 134
Boiler Tubes*
Clad Steel*
Coke 139
Electrical Sheets*
Electrodes*
Electroplating Supplies*
Fasteners 138
Ferroalloys 140
Iron Ore 138
Merchant Wire Products 138
Metal Powders*
Nonferrous
  Mill Products 133
  Primary Prices 127-132-133
  Remelted Metals 133
  Scrap 133
Piling 134
Pig Iron 138
Pipe and Tubing 139
Plates 136
Rails*
Refractories*
Service Center Prices 137
Shapes 134
Sheets 135
Spring Steel*
Stainless 138
Steel Scrap 130
Strip 134
Structurals 134
Tinplate 135
Tool Steel 138
Track Supplies*
Water Pipe Index 139
Wire 136
Wire Rod 135

*Appears in the Jan. 26-Feb. 9 issues.

SUPER ALLOYS...

SPECIAL METALS...

SPECIAL RUSH!!!

Ferrous, nickel and super alloys plus special metals in coil form are all stocked in quantity at Ulbrich. Coils in gauges down to .001 all tempers and other specific requirements. Weights from 1 ounce to 2,000 pounds or more. Write for complete Ulbrich stock list on special metals and super alloys plus stainless steel strip.

Contact your local stainless steel service center for Ulbrich fast service and delivery.

SINCE 1924
Ulbrich
"the biggest little mill in the country"

WRITE, WIRE OR PHONE
ULBRICH STAINLESS STEELS
WALLINGFORD, CONNECTICUT
TWX 277 Phone COlony 9-1434

Industrial Lists Up Slightly

Industrial list prices rose slightly in an otherwise dull market this week.

Domestic activity is still very much limited. Exports sustain coastal areas.

▪ Industrial lists brought some prices up in a rather dull market this week. The only area with weaker prices is Chicago where small purchases by local mills pegged the industrial market at a slightly lower level.

Generally, domestic activity is still limited around the country. Coastal areas are sustained by continued export demand.

In other developments this week, export moved a little closer to the Chicago and Pittsburgh scrap markets. The move comes with the sharp reduction in freight rates for exporting. The rail rate on scrap from Chicago to New Orleans has been slashed $6 a ton. Cuts of $1.48 a ton are proposed for barge rates from Pittsburgh and Chicago to the Gulf Coast.

General effect: It's now easier for exporters to move inland for scrap. Previously, exports have had little effect on the Pittsburgh market. The new rates may make a difference.

Pittsburgh — Industrial prices pulled the market up a notch this week although it is not clear that mill thinking has moved with the rise. On a local list, No. 1 factory bundles brought better than $2 over last month's price. This stirred the hopes of dealers and there is talk of asking prices as high as $36 for No. 1 dealer grades. But the tightness of supply has so far acted to reduce buying rather than increase mill prices.

Chicago — Small purchases by local mills had the effect of pegging the industrial market at a price slightly off last week's level. Generally, the market remains firm with some feeling that further advances can be expected later this month. Buying by local mills is still light, but export purchasing is active.

Philadelphia—The market is firm but unexciting. One dealer describes it as "stable to steady." However, the glow is definitely off this market. There is still very limited domestic business and export sustains the market.

New York—Scrap is moving well in this area but it's almost all export. Domestic activity is almost non-existent. Dealers say this is a check on the market. But there will be no real improvement until domestic activity becomes a factor.

Detroit—No. 1 industrial bundle prices rose slightly over January on the February lists. Other items stayed about the same. Mills want to keep No. 2 bundles at the same price as last month. They're hestitant to buy, however, since inventories are well filled. And it looks like mill operations may be slowed down a bit this month. Exporters bought tonnage at the same percentage of offerings as January. But about 20 pct less scrap was on the February list.

Cleveland—Auto lists went about $1 over last month's price with continued support from export speculation. Remaining production scrap is still enough to supply small demand from area mills. One Valley mill bought small tonnage of a special grade at $35. But other mills are only mildly interested. The prices for No. 1 grades are up 50 cents on appraisal. Some Valley mills are regulating incoming shipments.

Cincinnati—The price is up $1 and may go higher as up-river mills bid for local supplies. Production lists were up $2 on cars and will probably stay in the area. Some downriver production scrap may be barged to New Orleans for export.

St. Louis—The market has extended its listless, trendless state through another week. However, there is talk of higher prices but no one will venture to say when. There is still a standoff between the mills and dealers. More snow and freezing temperatures have made scrap collection almost impossible.

Birmingham — Scrap movement is practically at a standstill. A cutback in production apparently forced a Birmingham and a Gadsden steel mill to hold up shipments of orders placed earlier in January.

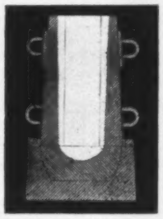
Buffalo — The market is unchanged. Dealers hold very little hope for increased activity in February. All prices remain the same.

Boston — A definite pickup in domestic business has been noted. Export, also, continues at an active pace. Sentiment is good.

West Coast—Talks are now going on between dealers and Japanese scrap buyers for next quarter's export business. It looks as if the Japanese mills will increase their purchases. Major domestic mills are out of the market.

Houston—Export still dominates the market. Short supplies of cut structural plate have upped the price of this item $1. Otherwise, the domestic situation remains dull and unchanged.

MEL-TROL®...the important extra you get in *Carpenter* Induction Vacuum Melted Alloys!



New, more refined melting processes such as Carpenter's VACUMELTROL® (induction vacuum) or CONSUMET® (consumable electrode) answers industry's need for better, more dependable steels for critical applications. But in induction vacuum alloys, Carpenter goes a step further. It's called MEL-TROL and it starts with an entirely new, patented mold that builds essential core-to-surface uniformity right into the ingot. Harmful impurities in the molten steel float to the top while the ingot solidifies . . . then are discarded. The result is more complete freedom from segregation and centerline weakness, and the most uniform, dependable alloys you can buy.

Benefits to you: *Improved alloy quality such as cleanness and soundness result in better forgeability, improved machinability and cold forming properties. You get more accurate forgings with better finishes . . . fewer rejects . . . faster production . . . and, most important, true predictable performance in critical alloy components. A wide range of these more uniform, more workable alloys is now available for high temperature and other critical applications. Call your nearby Carpenter representative for the whole story about MEL-TROL and what predictable performing steels can do for you.*

Carpenter steel

you can do it ***consistently*** better with Carpenter Specialty Steels for specialists

Steel

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

SCRAP PRICES *(Effective January 30, 1961)*

Pittsburgh

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	31.00 to 32.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	30.00 to 31.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	17.00 to 18.00
Low phos. punch'gs plate	37.00 to 38.00
Heavy turnings	26.00 to 27.00
No. 1 RR hvy. melting	35.00 to 36.00
Scrap rails, random lgth.	43.00 to 44.00
Rails, 2 ft. and under	47.00 to 48.00
RR specialties	42.00 to 43.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 bundles and solids	175.00 to 180.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	85.00 to 90.00
410 turnings	60.00 to 65.00

Chicago

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	30.00 to 31.00
No. 1 factory bundles	35.00 to 36.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	13.00 to 14.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Low phos. forge crops	39.00 to 40.00
Low phos. punch'gs plate, ¼ in. and heavier	37.00 to 38.00
Low phos. 2 ft. and under	35.00 to 36.00
No. 1 RR hvy. melting	33.00 to 34.00
Scrap rails, random lgth.	41.00 to 42.00
Rerolling rails	54.00 to 56.00
Rails 2 ft. and under	47.00 to 48.00
Angles and splice bars	41.00 to 42.00
RR steel car axles	55.00 to 56.00
RR couplers and knuckles	38.00 to 39.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast.	40.00 to 41.00
Cast iron wheel	31.00 to 32.00
Malleable	43.00 to 44.00
Stove plate	34.00 to 35.00
Steel car wheels	38.00 to 39.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	95.00 to 100.00
430 bundles and solids	90.00 to 95.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	12.00 to 13.00
Mixed bor. short turn.	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Shoveling turnings	18.00 to 19.00
Clean cast. chem. borings	25.00 to 26.00
Low phos. 5 ft and under	38.00 to 39.00
Low phos. 2 ft punch'gs	40.00 to 41.00
Elec. furnace bundles	37.00 to 38.00
Heavy turnings	25.00 to 26.00
RR specialties	40.00 to 41.00
Rails, 18 in. and under	49.00 to 50.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	39.00 to 40.00
Malleable	45.00 to 46.00
No. 1 machinery cast.	48.00 to 49.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$25.50 to $26.50
No. 2 hvy. melting	22.50 to 23.50
No. 1 dealer bundles	25.50 to 26.50
No. 2 bundles	18.00 to 19.00
Machine shop turn.	10.00 to 11.00
Shoveling turnings	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Low phos. 18 in. and under	36.00 to 37.00
Rails, random length	39.00 to 40.00
Rails, 18 in. and under	44.00 to 45.00
No. 1 cupola cast.	36.00 to 37.00
Heavy breakable cast.	29.00 to 30.00
Drop broken cast.	46.00 to 47.00

Youngstown

No. 1 hvy. melting	$32.50 to $33.50
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	32.50 to 33.50
No. 2 bundles	20.00 to 21.00
Machine shop turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Low phos. plate	34.00 to 35.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 dealer bundles	29.00 to 30.00
No. 1 factory bundles	34.00 to 35.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	13.00 to 14.00
Cut structural & plates, 2 ft & under	35.00 to 36.00
Low phos. punch'gs plate	30.00 to 31.00
Drop forge flashings	29.00 to 30.00
Foundry steel, 2 ft. & under	31.00 to 32.00
No. 1 RR hvy. melting	32.00 to 33.00
Rails 2 ft. and under	45.00 to 46.00
Rails 18 in. and under	46.00 to 47.00
Steel axle turnings	23.00 to 24.00
Railroad cast.	45.00 to 46.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	39.00 to 40.00
Malleable	44.00 to 45.00
Stainless	
18-8 bundles	160.00 to 165.00
18-8 turnings	80.00 to 90.00
430 bundles	75.00 to 80.00

Buffalo

No. 1 hvy. melting	$25.00 to $26.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 busheling	25.00 to 26.00
No. 1 dealer bundles	25.00 to 26.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	15.00 to 16.00
Cast iron borings	13.00 to 14.00
Low phos. plate	33.00 to 34.00
Structurals and plate, 2 ft. and under	35.00 to 36.00
Scrap rails, random lgth.	34.00 to 35.00
Rails 2 ft. and under	44.00 to 45.00
No. 1 machinery cast.	42.00 to 43.00
No. 1 cupola cast.	36.00 to 37.00

St. Louis

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	25.00 to 26.00
Foundry steel, 2 ft.	28.00 to 29.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	19.00 to 20.00
Machine shop turn.	7.00 to 8.00
Shoveling turnings	9.00 to 10.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	32.00 to 33.00
Rails, random lengths	37.00 to 38.00
Rails, 18 in. and under	40.00 to 41.00
RR specialties	39.00 to 40.00
Cupola cast.	38.00 to 39.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	34.00 to 35.00
Cast iron car wheels	33.00 to 34.00
Rerolling rails	49.00 to 50.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	19.00 to 20.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	34.00 to 35.00
Elec. furnace, 3 ft. & under	34.00 to 35.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft.	37.00 to 38.00
No. 1 RR hvy. melting	32.00 to 33.00
Scrap rail, random lgth.	40.00 to 41.00
Rails, 18 in. and under	45.00 to 46.00
Angles and splice bars	36.00 to 37.00
No. 1 cupola cast.	45.00 to 46.00
Stove plate	45.00 to 46.00
Cast iron car wheels	35.00 to 36.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 thvy. melting	20.00 to 21.00
No. 2 dealer bundles	15.00 to 16.00
Machine shop turnings	2.00 to 3.00
Mixed bor. and turn.	3.00 to 4.00
Shoveling turnings	5.00 to 6.00
Clean cast. chem. borings	17.00 to 18.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	32.00 to 33.00
Heavy breakable cast.	30.00 to 31.00
Stainless	
18-8 prepared solids	160.00 to 165.00
18-8 turnings	80.00 to 85.00
430 prepared solids	70.00 to 75.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$22.00 to $23.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	18.00 to 19.00
No. 1 busheling	22.00 to 23.00
Drop forge flashings	22.00 to 23.00
Machine shop turn.	7.00 to 8.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	11.00 to 12.00
Cast iron borings	11.00 to 12.00
Heavy breakable cast.	25.00 to 26.00
Mixed cupola cast.	30.00 to 31.00
Automotive cast.	36.00 to 37.00
Stainless	
18-8 bundles and solids	145.00 to 150.00
18-8 turnings	45.00 to 50.00
430 bundles and solids	50.00 to 55.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$23.50 to $24.50
No. 2 hvy. melting	19.00 to 20.00
No. 1 dealer bundles	23.00 to 24.00
No. 2 bundles	12.00 to 13.00
No. 1 busheling	24.00 to 25.00
Machine shop turn.	2.50 to 3.50
Shoveling turnings	5.50 to 6.00
Clean cast. chem. borings	13.50 to 14.50
No. 1 machinery cast.	37.00 to 38.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	26.50 to 27.50

San Francisco

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 1 dealer bundles	$27.00 to 28.00
No. 2 bundles	18.00
Machine shop turn.	14.00
Cast iron borings	14.00
No. 1 cupola cast.	46.00 to 48.00

Los Angeles

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	17.00
Machine shop turn.	12.00
Shoveling turnings	13.00
Cast iron borings	13.00
Elec. furnace 1 ft. and under (foundry)	42.00
No. 1 cupola cast.	39.00 to 40.00

Seattle

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	31.00
No. 2 bundles	21.00
No. 1 cupola cast.	36.00
Mixed yard cast.	31.00

Hamilton, Ont.

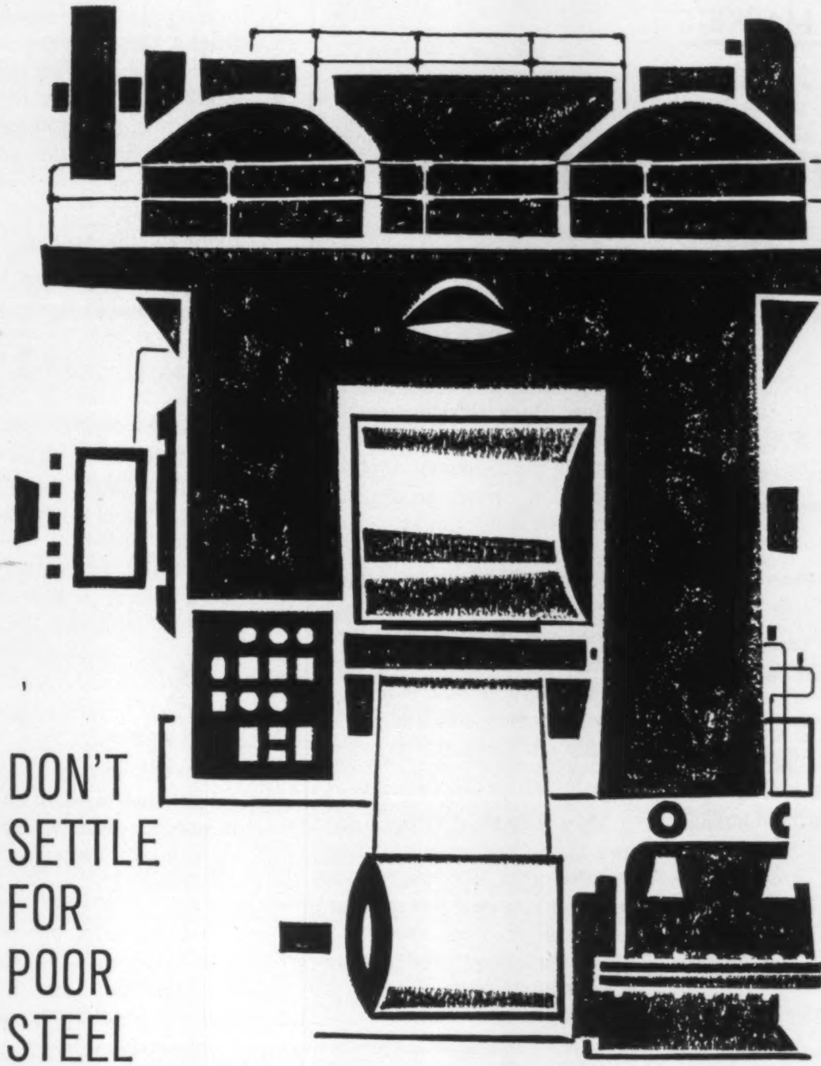
Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$24.00
No. 2 hvy. melting cut 3 ft. and under	22.00
No. 1 dealer bundles	24.00
No. 2 bundles	16.00
Mixed steel scrap	16.00
Bush., new fact, prep'd	23.00
Bush., new fact, unprep'd	18.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	30.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.00
No. 2 hvy. melting	29.00
No. 2 bundles	20.50
Machine shop turn.	8.00
Shoveling turnings	11.00
Cut structural plate 2 ft & under	$42.00 to 43.00
Unstripped motor blocks	26.00 to 27.00
Cupola cast.	33.00 to 34.00
Heavy breakable cast.	25.00 to 26.00



DON'T
SETTLE
FOR
POOR
STEEL
PERFORMANCE

LOOK TO LURIA

FOR DEPENDABLY ANALYZED AND SEGREGATED STAINLESS AND ALLOY STEEL SCRAP . . . . .

Luria Brothers and Company, Inc.

MAIN OFFICE • CHRYSLER BUILDING EAST, NEW YORK 17, N. Y.
BRANCH OFFICES • BIRMINGHAM, ALA. • BOSTON, MASS. • BUFFALO, N. Y. • CHICAGO, ILL. • CINCINNATI, OHIO • CLEVELAND, OHIO • DETROIT, MICHIGAN • HOUSTON, TEXAS • KOKOMO, INDIANA • LOS ANGELES, CALIF. • NEW YORK, N. Y. • PITTSBURGH, PENNA. • PHILADELPHIA, PENNA. • PUEBLO, COLORADO • READING, PENNA. • ST. LOUIS, MISSOURI • SAN FRANCISCO, CALIF. • SEATTLE, WASH. • In Canada • MONTREAL, QUEBEC—HAMILTON, ONTARIO
PLANTS • MODENA, PENNA. • MONTREAL, QUEBEC, CANADA

FOREIGN TRADE — LURIA INTERNATIONAL DIV., CHRYSLER BUILDING EAST, NEW YORK, N. Y. • 5050 S. BOYLE AVE., LOS ANGELES 58, CAL. • *Cable Address:* FORENTRACO

Aluminum Pricing Under Scrutiny

Has the aluminum industry gone too far in shaving prices to develop new markets? One authority says it has and questions the policy.

Some basis for the thinking shows up in 1960 annual reports. Rates of profits to sales is disappointing for most aluminum producers.

▪ "It's a mistake to drop prices too far just to compete, or to open up new markets," says an aluminum producers sales executive.

Take finstock for example, he says. The price has been dropped by about 6¢ per lb in 1960. Yet, this hasn't increased this market even one iota.

This particular aluminum producer hasn't exactly been in the foreground trying to open up new aluminum markets.

Change in Thinking — But its thinking may signal the end of the problem that has been causing trouble in the aluminum industry in the last few years.

Almost all of the year-end statements from the aluminum industry this year have indicated that 1960 was a good year in terms of market penetration, or tonnage sold. But 1960 was other than a good year in terms of the profits made on sales.

The reason: Marketing leaders in the industry have been conceding profits in order to open up new markets. For example, canning sheet sells for only 4¢ to 6¢ per lb over primary aluminum ingot—an obviously unprofitable level.

How Much Development?—This aluminum producer is not condemning the technique. It is needed, he says, to overcome the "human inertia" in many markets.

His point is that in the areas where the aluminum price has been trimmed, all that can be accomplished has been accomplished.

He says that he is not talking for the industry, but that, in his opinion, only incremental tonnages should be devoted to market development in 1961.

More Effects—Further indication that the technique of trimming the price to crack new markets may be coming to an end: For the first time in a number of decades, the sheet mill of a major producer showed no profit in 1960.

This has been the anchor of this company's operations. The word in the trade is that this company is seriously weighing its whole marketing approach.

Insiders say that current profits will be rated more important in 1961 than they have been in the last few years.

Aluminum Distributors—Aluminum warehousemen expect sales this year will be up to 5 pct above '60 levels.

Sales last year fell 2 pct below 1959, directors of the National Association of Aluminum Distributors reported last week in Phila.

Copper

The most intriguing rumor this week is that Russia is negotiating for large tonnages of Chilean copper.

A spokesman, recently returned from Chile, discounts much of the rumor. For one, he says, Russians would actually have to be in Santiago, Chile, to negotiate for Chilean copper. "In all the years I spent in Chile," he notes, "I heard many such rumors but was never able to locate the visiting Russians."

Output Committed—Also, it is common knowledge that almost all of Chile's output of copper for 1961 has been committed, mostly to Europe. It would be much simpler for Russia to buy copper it needs on the open European market.

A third factor that discounts this rumor: Russia is supposed to be interested chiefly in fabricated copper. Chile fabricates very little. Since copper is the main export, Chile is interested in moving the metal, not working it. The rumored Russian interest would be far in excess of Chile's capacity to work the raw metal.

Nevertheless, in the face of logical reasons to discount the rumor, it persists. Russian efforts in the copper market may bear some watching.

Tin prices for the week: Jan. 24—100.50; Jan. 25—100.375; Jan. 26—100.50; Jan. 27—100.625; Jan. 30—100.375*.

*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum Ingot	26.00	24.70	12/17/59
Copper (E)	29.00	30.00	1/16/61
Copper (CS)	29.00	30.00	1/11/61
Copper (L)	29.00	30.00	1/16/61
Lead, St. L.	10.80	11.80	12/13/60
Lead, N. Y.	11.00	12.00	12/13/60
Magnesium Ingot	36.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/6/56
Titanium sponge	150–160	162–182	8/1/59
Zinc, E. St. L.	11.50	12.50	1/12/61
Zinc, N. Y.	12.00	13.00	1/12/61

ALUMINUM: 99% Ingot COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 133.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.038	.048-.061	.077-.096	.136-.250
1100, 3003	48.4	47.4	46.4	45.4
5052	55.8	53.0	50.8	49.2
6061-0	53.0	50.3	48.4	47.0

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2,00	.188	.081	.032
AZ31B Stand, Grade	......	67.9	69.0	77.9	103.1
AZ31B Spec.	......	93.3	96.9	108.7	171.3
Tread Plate	......	70.6	71.7	......	......
Tooling Plate	73.0	......	......	......	......

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade. (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade... (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)	37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting)	40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	138	120	138
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	130	110	126
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54.13	....	51.36	55.32
Brass, Yellow	48.10	48.39	48.04	52.26
Brass, Low	50.65	50.94	50.59	54.71
Brass, Red	51.54	51.83	51.48	55.60
Brass, Naval	52.86	59.17	46.67	57.02
Muntz Metal	50.94	....	46.25	....
Comm. Bz.	52.98	53.27	52.92	56.79
Mang. Bz.	56.80	....	50.20	....
Phos. Bz. 5%	74.59	74.34	75.09	76.52

Free Cutting Brass Rod.......................... 33.71

TITANIUM

(Base Prices f.o.b. mill)

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17.00. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.	29.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be	$65.00
Beryllium copper, per lb conta'd Be	$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading	$70.00
Bismuth, ton lots	$ 2.25
Cadmium, del'd	$ 1.50
Calcium, 99.9% small lots	$ 4.55
Chromium, 99.8% metallic base	$ 1.31
Cobalt, 97-99% (per lb)	$1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined	$29.95 to $36.95
Gold, U. S. Treas., per troy oz.	$35.00
Indium, 99.9% dollars per troy oz.	$ 2.25
Iridium, dollars per troy oz.	$75 to $85
Lithium, 98%	$9.00 to $12.00
Magnesium sticks, 10,000 lb.	57.00
Mercury, dollars per 76-lb flask f.o.b. New York	$208 to $210
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel	69.60
Palladium, dollars per troy oz.	$24 to $26
Platinum, dollars per troy oz.	$82 to $85
Rhodium	$137 to $140
Silver ingots (¢ per troy oz.)	91.375
Thorium, per kg	$43.00
Vanadium	$ 3.65
Zirconium sponge	$ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115	27.25
No. 120	26.25
No. 123	25.25
80-10-10 ingot	
No. 305	31.75
No. 315	29.50
88-10-2 ingot	
No. 210	39.50
No. 215	36.25
No. 245	31.50
Yellow ingot	
No. 405	22.75
Manganese bronze	
No. 421	26.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.	24.25-24.50
0.60 copper max.	24.00-24.25
Piston alloys (No. 132 type)	26.00-27.00
No. 12 alum. (No. 2 grade)	22.75-23.25
108 alloy	23.25-23.75
195 alloy	25.75-26.75
13 alloy (0.60 copper max.)	24.00-24.25
AXS-679 (1 pct zinc)	23.00-24.00

(Effective Jan. 30, 1961)

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-87½%	23.75-24.75
Grade 2—92-95%	22.50-23.50
Grade 3—90-92%	21.50-22.50
Grade 4—85-90%	21.00-22.00

SCRAP METAL

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25	24¼
Yellow brass	19¼	17⅜
Red brass	22¼	21½
Comm. bronze	23	22¼
Mang. bronze	18⅛	17⅜
Free cutting rod ends.	18⅜	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	25
No. 2 copper wire	22½
Light copper	20¼
*Refining brass	20¾
Copper bearing material	20

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24
No. 2 copper wire	22¼
Light copper	20
No. 1 composition	19¾
No. 1 comp. turnings	19
Hvy. yellow brass solids	15
Brass pipe	14
Radiators	16
Aluminum	
Mixed old cast.	12 —12½
Mixed new clips	13¾—14¼
Mixed turnings, dry	12¾—13¼

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	21 —21½
No. 2 copper wire	19 —19½
Light copper	17 —17½
Auto radiators (unsweated)	12 —12½
No. 1 composition	16 —16½
No. 1 composition turnings	15 —15½
Cocks and faucets	12¾—13
Clean heavy yellow brass	12 —12¼
Brass pipe	13 —13½
New soft brass clippings	13 —13½
No. 1 brass rod turnings	12½—13

Aluminum

Alum. pistons and struts	6½— 7
Aluminum crankcase	8½— 9
1100 (Ss) aluminum clippings	11½—12
Old sheet and utensils	8½— 9
Borings and turnings	4½— 5
Industrial castings	9 — 9½
2020 (24s) clippings	10 —10½

Zinc

New zinc clippings	6 — 6¼
Old zinc	3 — 3½
Zinc routings	2 — 2¼
Old die cast scrap	1¼— 1½

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	23-23.50
Clean Monel turnings	16.50-17
Old sheet Monel	22-23
Nickel silver clippings, mixed.	18
Nickel silver turnings, mixed.	15

Lead

Soft scrap lead	7 — 7½
Battery plates (dry)	3 — 3¼
Batteries, acid free	2 — 2¼

Miscellaneous

Block tin	75 —77
No. 1 pewter	57.50—58
Auto babbitt	43 —44
Mixed common babbitt	10 —10½
Solder joints	13½—14
Small foundry type	9 — 9½
Monotype	9 — 9½
Lino. and stereotype	8 — 8¼
Electrotype	7½— 7¾
Hand picked type shells	5¼— 5¾
Lino. and stereo. dross	2 — 2½
Electro dross	2¼— 2¾

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh Midland Butler Aliquippa N. Castle McKeesport Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3, B4, M10* 7.525 *E3*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, City, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras.

(Effective Jan. 30, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Thin *0.25* lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*				$9.20 *U1*	$6.35 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*	6.775 *B3*		7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*	**Holloware Enameling** *29* ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City.		
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3*	6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *U1, Y1, I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1, Y1*	$6.25 *U1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*†† *R3*	7.525 *R3, S1*	9.275 *R3*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*		6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2, R3*	$10.50 *T2*	$9.20 *T2*	$6.35 *T2*
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Jan. 30, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	**Bethlehem, Pa.**				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *P2*	6.375*P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.		5.675 *B3*									
	Fairless, Pa.	5.825 *U1*	5.825 *U1*									
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	**Alton, Ill.**	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875*L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Plymouth, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*				7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	**Emeryville, Fontana, Cal.**	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*		7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	**Atlanta, Ga.**	5.875 *A8*	5.25 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*	5.675 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Jan. 30, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities		Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
	City Delivery‡ Charge	Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (10 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	......	......	......	......
Baltimore	$.10	7.87	9.71	10.16	10.28	8.44	9.13	8.65	11.80	17.48	16.48	21.58	20.83
Birmingham		8.46	10.20	10.69	9.45	8.41	8.47	8.26	13.14	16.76	16.76	......	......
Boston	.10	9.84	10.68	11.87	12.26	9.72	10.26	9.87	13.45	17.79	16.69	23.89	21.04
Buffalo	.15	8.70	9.45	11.40	11.15	8.80	9.30	8.90	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.85	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.90	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.69	11.40	17.21	16.21	21.31	20.56
Denver		10.90	12.53	13.27	13.07	10.74	11.24	10.88	12.97	......	......	......	20.84
Detroit**	.15	9.63	10.61	11.20	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		10.17	10.98	11.35[3]	11.73	9.90	9.81	9.58	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	9.59	11.42	10.95	11.76	9.43	9.93	9.57	11.77	17.17	15.87	21.87	21.12
Los Angeles		9.50[1]	11.20	12.20	11.29	9.82	10.54	9.67	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.13	10.50	......	10.79	8.81	9.16	8.97	12.89	......	......	......	......
Milwaukee**	.15	9.51	10.49	10.99	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.24	20.49
New York	.10	9.77	10.23	11.45	11.56	9.61	10.30	9.84	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	......	......	8.90	8.65	9.20	8.90	10.70	......	......	......	......
Philadelphia	.10	8.95	10.10	10.99	10.45	8.80	9.05	8.85	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		9.45	11.30	12.35	11.45	9.60	10.05	9.45	16.65	18.60	17.80	22.70	22.20
San Francisco	.10	10.27	11.79[2]	11.50	11.88	10.48	10.59	10.17	15.20	18.30	17.35	22.90	22.20
Seattle		10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.20	18.60	17.80	22.70	22.15
Spokane	.15	10.51	11.57	12.50	11.95	10.10	10.65	9.94	16.35	17.75	17.95	21.58	22.30
St. Louis**	.15	9.57	10.75	11.23	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.83
St. Paul	.15	8.94	9.84	10.99	11.16	8.83	9.33	8.97	11.64	....	16.69	....	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. **Prices shown** are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—⅛" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—¾-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13¢ zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Jan. 30, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	......	......
Birmingham *W9*	62.00	62.50*	66.50	......	......
Birmingham *U4*	62.00	62.50*	66.50	......	......
Buffalo *R3*	66.00	66.50	67.00	67.50	......
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	......
Chester *P2*	68.00	68.50	69.00	......	......
Chicago *I4*	66.00	66.50	66.50	67.00	......
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	......
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	......	......	......
Geneva, Utah *C7*	66.00	66.50	......	......	......
Granite City *G2*	67.90	68.40	68.90	......	......
Hubbard *Y1*	......	......	66.50	......	......
Ironton, Utah *C7*	66.00	66.50	......	......	......
Lyles, Tenn. *T3*	......	......	......	......	73.00
Midland *C11*	66.00	......	......	......	......
Minnequa *C6*	68.00	68.50	69.00	......	......
Monessen *P6*	66.00	......	......	......	......
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	......	66.50	67.00	67.50	......
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	......	66.50	67.00	......
So. Chicago *R3*	66.00	66.50	66.50	67.00	......
So. Chicago *W8*	66.00	......	66.50	67.00	......
Swedeland *A2*	68.00	68.50	69.00	69.50	71.00†
Toledo *I4*	66-00	66.50	66.50	67.00	......
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	......	......	66.50	......	......

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel.

Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container)	*Pct*
Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	46
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	46

(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	46	46

Machine Screws—bulk

¼ in. diam or smaller	25,000 pcs	50
5/16, ⅜ & ½ in. diam	15,000 pcs	50

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50– 32.75	32.00	29.50– 34.50	47.50	38.00	46.50	—	19.25- 21.50	—	19.75 21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25 31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7*, Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13*, (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1*, (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	46	57
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	56	60
	15,000 pcs	
	56	60

Rivets

	Base per 100 lb
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	15

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Jan. 30, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3****	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	...	...	...	...	...	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	...	...	...	...	...	9.00	9.55
Chicago *W7*	173	...	...	...	...	9.00	9.55†
Cleveland *A6*	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	9.00	...
Crawf'dav. *M4***	175	193	...	214	199	9.10	9.85
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	...	...	...	...	...	...
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
Rankin Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	...	...	...	236	...	9.95	10.50
Sparrows Pt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*	179	...	...	...	...	9.30	9.85
Williamsport *S5*	...	...	...	...	...	...	...

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50	......	......	......	......	......	......	......	......
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50	......	......	......	......	......	......	......	......
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Fontana *K1*	+6.25	......	+2.25	......	0.75	......	1.25	......	1.75	......	2.25	......	2.75	......	......	......	......	......	......	......	......	......
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50	......	......	......	......	......	......	......	......
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	......	......	......	......	......	......	......	......
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50	......	......	......	......	......	......	......	......
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

HOW LONG SINCE YOU CHECKED ON PERFORATIONS?

No matter what material your product demands Mundt can supply the exact perforation you need. Steel, brass, copper, monel, bronze, aluminum, zinc, tinplate, lead, stainless steel, coated metals, bonded materials, plastics, and paper are punched as required for every functional and ornamental need.

You can count on Mundt's guarantee that sheets are perfectly flat, straight, parallel on the sides, and free from buckle or camber.

Our modern tool and machine shop is constantly making new dies to add to the tremendous variety of screens available. If you have a special problem we'll gladly supply design and metallurgical assistance.

No job is too small for our careful, personal attention . . . or too large for prompt delivery. Mundt's 90 years' experience is at your disposal.

Write for Free Catalog

CHARLES MUNDT & SONS

53 FAIRMOUNT AVENUE, JERSEY CITY 4, N. J.

PERFORATING SPECIALISTS FOR ALL TYPES OF MATERIALS

Rear-pump body for automatic transmission cast **from gray** iron using shell-molds and -cores.

modern shell-mold casting for:

IMPROVED ACCURACY

Size and location of the oil ports in the pump body illustrated are maintained within *a tolerance of 0.015 inch* by using shell-cores.

SMOOTHER FINISHES

Faithful reproduction obtained with shell-molds, and the absence of burnt-in sand reduce the amount of machining and finishing required.

GREATER RELIABILITY

Carefully controlled analysis plus precise heat-treating in our own modern facilities insure uniformly high quality and dependability.

OVERNIGHT DELIVERY WITHIN 500 MILES

to fill your IMMEDIATE NEEDS for QUALITY PRECISION CASTINGS at LOWER COST

GL GREAT LAKES FOUNDERS & MACHINE CORP.
LUDINGTON, MICH.

Specialists in Stack, CO₂, and Shell-Mold Casting

FERROALLOY PRICES

Ferrochrome

Cents per lb contained Cr, lump, bulk, carloads, del'd. 65-71% Cr, .30-1.00% max. Si.

0.02% C	41.00	0.50% C	33.25
0.05% C	34.00	1.00% C	33.00
0.10% C	33.75	1.50% C	32.75
0.20% C	33.50	2.00% C	32.50

3-5% C, 53-63% Cr, 2.5% max. Si	26.00
4-6% C, 58-63% Cr, 3-6% Si	22.50
5-8% C, 58-63% Cr, 3-6% Si	22.50
6-8% C, 50-56% Cr, 4-7% Si	22.00
4.00-4.50% C, 60-70% Cr, 1.2% Si	28.75
0.025% C (Simplex)	31.50
0.010% C max, 63-66% Cr, 5-7% Si.	32.50
0.010% C max, 68-71% Cr, 2% Si max	31.50
0.25% C max	33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Low Carbon Ferrochrome Silicon

(Cr 39-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in x down, packed.

Price is sum of contained Cr and contained Si.

	Cr	Si
Carloads, bulk	22.50	14.60
Ton lots	30.45	16.05
Less ton lots	33.40	17.70

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	11.00
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	11.00
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.70
Ton lots packed in bags	16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

	Palmerton, Pa.		Neville Is., Pa.
Mn	10 lb, pig	35 lb, down	35 lb
16-19%	$98.00	$96.00	$100.50
19-21%	100.00	98.00	102.50
21-23%	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk	34.25
Ton lots, palletized	36.25
250 to 1999 lb	39.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn ... 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads (Bulk)	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk	11.60
Ton lots, packed	13.25
Carloads, bulk, delivered, per lb of briquet	14.00
Briquets, packed pallets, 2000 lb up to carloads	16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	14.60	75% Si	16.90
65% Si	15.75	85% Si	18.60
90% Si	20.00		

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb.	2.40	3.30	4.55

(Effective Jan. 30, 1961)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.	
Carloads, bulk	9.85¢
Ton lots	11.20¢
Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo	$1.50
Ferrocolumbium, 58-62% Cb, 2 in. x D, del'd per lb con't Cb	
Ton lots	$3.45
Less ton lots	3.50
Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta	$3.40
Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo	$1.76
Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton	$120.00
10 tons to less carload	$131.00
Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti	$1.35
Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti	$1.50
Less ton lots	$1.54
Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	$255.00
Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered	$2.15 (nominal)
Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa.	$1.49
bags, f.o.b. Washington, Pa., Langeloth, Pa.	$1.38
Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.	
Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢
Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5	$1.38
Zirconium silicon, per lb of alloy 35-40% del'd, carloads, bulk	26.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	
2000 lb carload	$5.50
Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound	30¢
Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.	
Ton lots per pound	18.25¢
Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots	$1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up	
10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50
Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over	
No. 1	$1.05
No. 79	50¢
Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd	
Ton lots (packed)	$1.46
Less ton lots (packed)	1.57
Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots	2.15

Stop Deep Draw Scrap...

PHOTO COURTESY REYNOLDS METALS CO., RICHMOND, VA.

With a DucΦmatic, you can accurately predict forming quality, and reject defective material before it is fabricated.

The new Tinius Olsen Sheet Metal Tester—by reproducing actual deep draw forming stresses—reveals more important, usable data than any other ductility tester.

By cutting scrap losses, eliminating rework and prolonging the life of costly dies, the DucΦmatic quickly pays for itself.

Find out more about the DucΦmatic—another years-ahead development from Tinius Olsen. Write today for Bulletin 62.

TINIUS OLSEN
Testing Machine Co.
2120 Easton Rd. • Willow Grove, Pa.

ELECTRIC FURNACE STEEL CASTINGS

are engineered to *YOUR* specific requirements

"C" steel castings are CLEAN steel castings of uniform structure that will minimize machining and assembly costs, permit of greater freedom and efficiency of design and add to your product the recognized strength, endurance and desirability of steel. C steel castings, foundry engineered from pattern to finished casting can be had in

CARBON, ALLOY OR STAINLESS STEEL
SAND OR SHELL MOULDED

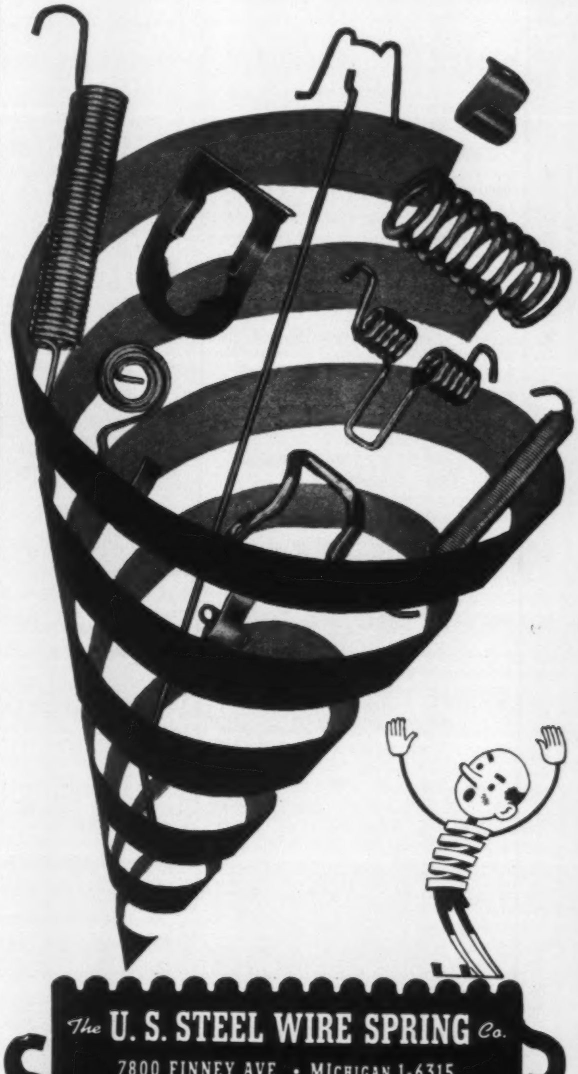
The technical experience and knowledge of our engineering staff are at your service. Write, phone, or call.

CRUCIBLE STEEL CASTING CO.
LANSDOWNE 1, PENNA.

Producing all Types of SPRINGS, WIRE FORMS and SMALL STAMPINGS to Exact Specification

U. S. Steel Wire springs and small stampings of high carbon steel can help keep your rejects to a minimum while lowering your production costs. That's because rigid quality control and close inspection are standard operating procedures in our handling of your orders. Since dependable springs or small stampings and better products go hand-in-hand, why not let us quote on your requirements.

No order too large or too small!



The **U. S. STEEL WIRE SPRING** Co.
7800 FINNEY AVE. • MICHIGAN 1-6315
CLEVELAND 5, OHIO

RAILWAY EQUIPMENT
USED and RECONDITIONED
RAILWAY CARS and REPAIR PARTS

DIESEL-ELECTRIC LOCOMOTIVES
Various Sizes
* * * * * * *
CRANE, Burro—5½-Ton
* * * * * * *
Specifications & Prices Upon Request

FREIGHT CARS
Air Dump—Box—Flat—Hopper
Excellent Condition—Ready for Service

IRON & STEEL PRODUCTS, INC.
13496 S. Brainard Ave.
Chicago 33, Ill.
Ph. Mitchell 6-1212
51-B E. 42nd St.
New York 17, N. Y.
Ph. YUkon 6-4766

• IMMEDIATE LIQUIDATION •
FROM
CRAMET INC. TITANIUM PLANT
CHATTANOOGA, TENN.

Magnesium Reduction Furnaces, Gas and Electric.

Electric Distillation Vacuum furnaces, complete with Electrical Equipment and Kinney High Vacuum Pumps.

Pittsburgh Lectrodryer Dehumidifiers, 3,000, 12,000 and 15,000 C.F.M.

— SPECIAL —

2—18' Wheelabrator Cabinets, with Dust Collector.

• REPRESENTATIVE ON SITE •

SOUTHERN FOUNDRY SUPPLY
INCORPORATED
P. O. BOX 566 Chattanooga, Tennessee

VARIABLE VOLTAGE DRIVES
3 PHASE 60 CYCLE

Quan.	Size	Description
2	3000 HP	DC MOTORS—525 V. 600 RPM Whse M.G. Sets—2500 K.W. Whse., 2300/4160 V
1	2750 HP	DC MOTOR 450 V. 300 RPM Elliott 2200 K.W., Gen. Elec. 3 unit 450 V. DC Gen. with 3000 HP 720 RPM, 2300 V. AC Motor and Etc.
1	2250 HP	DC MOTOR 600 V. 400/500 RPM, G.E. M.G. Set—2000 K.W. G.E. AC Motor—2300 V.
1	1500 HP	DC MOTOR 600 V. 600 RPM Whse. M. G. Set. 1500 K.W. G.E. 13,200 V.
1	1500 HP	DC MOTOR 600 V. 300/700 RPM Whse. M.G. Set—1500 K.W. G.E. 13,200 V.

For listing of Motors, Generators, Transformers, M.G. Sets, Rectifiers, Mill Motors, etc.
See last week issue.
Write — Phone — Wire
BELYEA COMPANY, Inc.
47 Howell St., Jersey City, N. J.
Tel. Oldfield 3-3334

THE CLEARING HOUSE

Business Falls Off In California

Used machinery business in California has fallen off. Some dealers are putting packages together to boost sales.

However, in Seattle the activity is on the rise. Demand and prices are up.

▪ "Business has fallen off. There's darn little moving. We're getting lots of inquiries—but very little buying. However, we're not crying."

That's the way a leading used machinery dealer sums up the Los Angeles and San Francisco picture.

Another dealer, not jumping with joy over sales, still clings to hopes of a turnup after July. He looks for new government spending to stimulate the used machinery business.

Prices Off—Prices have pretty much fallen apart except on newer specialized hard-to-get items, dealers report. Some machines are going at cost and below.

One reason: pressure to lighten inventories before the California State property tax deadline. It runs about 8 pct, due in March.

"In some cases," one unhappy dealer says, "you can't afford to sell and you can't afford to hold."

Package Deals—Some are putting package deals together. This ties an item in demand with a poor seller to squeeze the latter out of inventory.

"Junk doesn't move at all," one dealer says. He told of selling an engine lath for $4000 and throwing in a $600 "junk item" to sweeten the package.

There is some demand for large tools—vertical and horizontal boring mills. These items are relatively scarce on the West Coast. While available in the East, customers won't pay the freight and other costs.

Equipment later than 1955 is in good demand but hard to get. On such machines prices are holding up well.

Government Surplus—Since the turn of the year, a large amount of government surplus equipment has come into the California markets. Southern California dealers are loaded with grinding machines, turret lathes, band saws, and shapers.

In Seattle, there's a sudden wave of optimism. Spurred by several important Puget Sound area contracts in recent weeks, the used machinery market is in an unaccustomed midwinter flurry.

Suppliers report demand and prices up. This comes on the heels of: (1) government proposals for $1.1 billion worth of projects involving Boeing Airplane Co.

(2) The $8 million conversion job for the American President liner Leilani, awarded Puget Sound Bridge and Dry Dock Co.

(3) Word that the Puget Sound Naval Shipyard at Bremerton will be working on eight Naval ships by May.

The work at Bremerton may come up to as much as $190 million.

Machinery Demands—The size of the contracts and their impact are producing a demand for all kinds of used equipment. Even heavy machines, usually slow movers in Seattle, are wanted.

SHEET METAL MACHINERY

SPECIAL! 13' ⅜" Shear, 20" gap....$5,000.00

10' 10 ga. Pexto Shear, Model S3120
8' 18 ga. Niagara Underdriven Power Shear
10' ½" Circle Shear, Air Clamp
12' ¼" Chicago Power Leaf Brake
10' 10 ga. All Steel Press Brake
12' ⅛" All Steel Press Brake
8' 12 ga. All Steel Press Brake
100 KVA Rex Spot Welder, Synch. Timer
10' ENGEL SHOPMASTER DUCT TABLE
43 and 60 ton Niagara Presses, deep throat
50 ton Federal Punch Press, #5 OBI

MILTON EQUIPMENT COMPANY
4th & Race Sts. Phila. 6, Pa.
WAlnut 2-1734, 3488

IMMEDIATELY AVAILABLE
Because of Mill Consolidation

3 LEE WILSON RECTANGULAR BELL-TYPE ANNEALING FURNACES

atmosphere-controlled with 9 bases, are available. Each is approximately 7' x 7' x 14'. Excellent when used for manufacture of steel coils, they have a capacity of 50 tons per charge. These top-grade furnaces are still set up in the plant. Tremendous values specially priced for prompt sale.

NATIONAL MACHINERY EXCHANGE
126 Mott St. New York 13, N. Y.
CAnal 6-2470

CRANE
WITH MAGNET EQUIPMENT

P & H Model 655-B late type, 30 ton crawler crane, Cat D-13000 Diesel engine. 55" New E.C.M. circular magnet. Call

ARROW EQUIPMENT CO.
4646 S. KEDZIE AVE.
CHICAGO, ILL. FRontier 6-6500

MACHINES FOR YOUR YARD

Austin 8 ton roller
Adams Tandem Grader
American car puller
Vermeer ditcher 524-T
Link Belt shovel LS-85
Ford tractor w/Arps trencher

TRACTOR & EQUIPMENT CO.
10806 Southwest Highway, Oak Lawn, Ill.
Chicago Phone HI-lltop 5-6500

OVERHEAD TRAVELING CRANES

2 ton Shepard Niles fully motorized Electric Bridge Cranes, spans from 18' to 30'

3 ton Cranes, span 18' to 26'

Call or Write today!

L. J. LAND, INC.

P. O. Box 756
Reading, Pa.
FRanklin 5-8474

P. O. Box 689
Weehawken, N. J.
UNion 4-1010

UNIVERSAL Machinery & Equipment Co.

AMERICA'S LARGEST STOCK OF FOUNDRY EQUIPMENT

• ARC MELTING FURNACES
250# LECTROMELT—185 KVA
500# LECTROMELT—200 KVA
1000# SWINDELL—500 KVA
2000# SWINDELL—1000 KVA
3000# HEROULT, Door Charge
DETROIT FURNACES—10 lb. to 300 lb. Cap.

• INDUCTION HEATING FURNACES
75 KW TOCCO M.G. Induction Heater 2 station
20 KW THERMONIC Induction Heater 2 station
20 KW ECCO Induction Heater
15 KW GIRDLER Dielectric Heater

• INDUCTION MELTING FURNACES
20 KW AJAX Spark Gap 17# Melting
30 KW VACUUM Melting, Complete—Like New
100 KW AJAX Melting Installation—Late
200 KW, 960 cycle, 1000# steel

400# & 600# FISHER MNP
Gas Fired Melting

• HEAT TREAT FURNACES
4'x4'x10' Gas Fired Box 1500°F.
7' G. E. Rotary Hearth Electric, 1900°F.
36" dia. x 36" deep Electric Recirculating
42" wide roller Hearth 50'L w/atmos. gen.
24"x16'Lx36" 210 KW conveyor. 1400°F.
10"x12"x24" LINDBERG 2500°F. hydrogen

• CLEANING EQUIPMENT AND GRINDERS
15x20 WHEELABRATOR
20x27 WHEELABRATOR
27x36 WHEELABRATOR w/loader
36x42 WHEELABRATOR w/loader
48x42 WHEELABRATOR w/loader
48x48 WHEELABRATOR w/loader
48x72 WHEELABRATOR w/loader
#1A WHEELABRATOR Multi-table
WHEELABRATOR Pipe Cleaning Cabinet to 12" O.D.
6' LG PANGBORN Table
6' LK PANGBORN Table-room

dust Collectors available for all machines

72" WHEELABRATOR SWING TABLE
Capable of handling work 72" in diameter & 40" high, complete w/2 aux. tables, #8 Model 70 dust collector & many Long Life spare parts.
SAVE — SAVE — SAVE — SAVE — SAVE

1630 NORTH NINTH ST. READING, PA. PHONE FRANKLIN 3-5103

PRESSES
BRAKES SHEARS

Will Lease or Furnish Long Terms

JOSEPH HYMAN & SONS
2600 E. Tioga St., Philadelphia 34, Pa.

Faster From Foster

Nation's Largest Warehouse Stocks

RAIL AND TRACK MATERIAL
PIPE, VALVES, FITTINGS

L. B. FOSTER CO.
Pittsburgh 30 · New York 7 · Chicago 4 · Houston 2
Los Angeles 5 · Atlanta 8 · Cleveland 35

SIDE TRIMMERS

72" x 8" dia. arbor Aetna-Standard Side Trimmer & Slitter, housings can be extended to accommodate 97" width, motorized rotary scrap chopper, power pinch rolls, power adjustment to housings, complete unit including gear drives mounted on a fabricated steel base, misc. spares included

42" x 8" dia. arbor Aetna-Standard Side Trimmer & Slitter, housings can be extended to accommodate 67" width, motorized rotary scrap chopper, power pinch rolls, power adjustment to housings, complete unit including gear drives mounted on a fabricated steel base, misc. spares included

LANG MACHINERY COMPANY, INC.
28th St. & A.V.R.R. Pittsburgh 22, Pa.
GRant 1-3594

OFFERING
BRIDGE CRANES

ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

---

eastern Rebuilt Machine Tools
THE SIGN OF QUALITY—THE MARK OF DEPENDABILITY

ENGINE LATHES
22" Model M—actual swing 27½x336" Monarch, m.d.
22"x48" LeBlond, m.d.
22" Model CMx96" cc Monarch, m.d.
24"x72" cc LeBlond, m.d.
24" Model M—actual swing 24½" swing, 264" cc Monarch, m.d., late
24"x106" Meuser Gap Lathe, m.d.
25" raised in sand to swing 36½x48" Monarch, 1952
25" raised in sand to swing 37½x54" Boye & Emmes
25"x120" Boye & Emmes, vee belt, m.d.
27"x96" cc American H.D., m.d., late
27"x120" cc LeBlond Geared Head, m.d.
27"x192" cc LeBlond, m.d., 1944
30" Model NNx60" cc Monarch, m.d.
30"x136" LeBlond, m.d.
36"x30" cc (maximum 30'8") Niles "Time-Saver," m.d.
36"x144" cc Wickes Quick Change 3 step cone pulley belt drive
36"x31' 5⅛" centers Lodge & Shipley Selective, m.d.
42"x32' Niles Heavy Duty Internal, m.d.
48"x41' cc Niles Internal Geared H.D., m.d.
48"x108" cc American, m.d., 1942
48"x108" Niles Internal Engine Lathe, m.d.
48"x156" Niles Internal Engine Lathe, m.d.
48"x32" cc American H.D. Internal Geared Head, m.d.

MANUFACTURING LATHES
No. 1 LeBlond Automatic Turbine Wheel Lathe, Hydr-Trace Attachment, m.d.
4x60" LaSwing, m.d.
11x18" LeBlond Rapid Production, m.d.
12x12" cc Model 5T Monarch, m.d.
12x18" Reid Small Piece Production, Model 6WSL, m.d.
14"x21' centers Model LS Semi-Automatic Lo-Swing, m.d.
16"x34" cc LeBlond Semi-Special, vee-belt drive, 1942
20"x25" Jones & Lamson Fay Automatic Lathe, 1944
No. 3 Lodge & Shipley Duomatic, m.d., late type
No. 3A Lodge & Shipley Duomatic, m.d.
No. 8 Sundstrand Auto. Stub., m.d.
No. 12 Sundstrand Automatic Production, m.d.
No. 12 Gisholt Auto. Production, m.d.
No. 16 LeBlond Automatic, m.d.
Lipe Semi-Automatic Carbo Lathe, m.d.
Colburne Mfg. Bench Type Speed Lathe, m.d.
Model NA2B Schauer Speed lathe
No. 9WSL, Reid Production, m.d.
36" Wickes Center Drive Tracer lathe, m.d., 1953
60" Lodge & Shipley "T" Lathe, 2 carriages, copymatic tracer

We carry an average of 2,000 machines in our 11 acre plant at Cincinnati. Visitors welcome at all times.

THE EASTERN MACHINERY COMPANY
1002 Tennessee Avenue, Cincinnati 29, Ohio
MElrose 1-1241 CABLE ADDRESS—EMCO

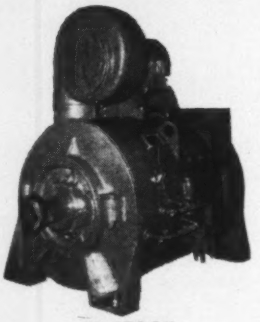
ROLLING MILLS—STEEL WORKS EQUIPMENT

- 1—35 2-HIGH BLOOMING MILL, with reversing motor, M.G. set, tables, manipulator.
- 1—3-HIGH PLATE MILL, 40" & 26½" x 112".
- 1—34" & 22" x 112" PLATE MILL, 3-high.
- 1—32" & 20" x 56" 3-HIGH SHEET MILL with motor driven screwdown and pre-set controls.
- 1—25" & 42" x 66" HOT STRIP MILL, 4-high.
- 4—29" 2-HIGH HOT SHEET MILLS, with tables.
- 1—16" & 28" COLD MILL, 2-high, 200 HP drive.
- 1—26" COLD SHEET MILL TRAIN, 6 stands, 400 HP motor and drive.
- 1—8" x 12" 2-HIGH COLD MILL, 50 HP motor, reel.
- 1—3½" & 8½" x 5½" STRIP MILL, 4-high.
- 1—16" BAR MILL, 3-high, single stand.
- 1—9" BAR MILL, 3-high, five stands.
- 1—34" x 192" ROLL GRINDER.
- 1—450 TON DOWN-CUT CROP SHEAR, 14" stroke, length of knives 28".
- 1—VERTICAL OPEN-SIDE BAR SHEAR, 28" knife, capacity 1" x 24" or equal.
- 1—SHEAR, 1" x 110" plate.
- 2—SQUARING SHEARS for ¼" x 156" sheets.
- 2—SQUARING SHEARS for 10 ga. x 120" sheets.
- 1—ROLLER LEVELER, 1" x 144" plate.
- 4—LEVELERS for sheets, 17 rolls, widths 48", 54", 66", 72".
- 1—CRANE, 15 TON 48' 6" SPAN, 220/440 A.C.
- 1—AUTOMATIC SQUARING SHEAR UNIT for sheets, 162" side cut, 72" end cut.
- 1—ROLL LATHE, ENCLOSED HEADSTOCK, up to 40" dia. rolls.
- 1—BILLETEER, size C, for conditioning billets from 3" to 12" square, up to 18' lengths.
- 1—SLITTER FOR SHEETS up to 144" wide.
- 1—CORRUGATING MACHINE for sheets 144" long, 3 sets of removable dies.
- 1—HALLDEN STRAIGHTENING AND CUTTING-OFF MACHINE, capacity 516" to ⅝" dia x 14 ft.
- 1—POINTER, tube 2" O.D. x ¼" wall maximum.
- 1—1500 HP GEAR DRIVE, ratio 8 to 1.
- 1—1200 HP GEAR DRIVE, 295 to 30 RPM.
- 1—1200 HP GEAR DRIVE, 353 to 94.5 RPM.
- 1—600 HP GEAR DRIVE, 1.698 to 1 ratio.
- 1—400 HP GEAR DRIVE, 8.2 to 1 ratio.
- 1—1500 HP MOTOR, 2300 volts, 3 phase, 60 cycle, 240 RPM.
- 1—600 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
- 1—400 HP MOTOR, 440 volts, 3 phase, 60 cycle, 450 RPM.
- 1—400 HP MOTOR, 2300/4600 volts, 3 phase, 60 cycle, 450 RPM.
- 1—400 HP MOTOR, 2200 volts, 3 phase, 60 cycle, 360 RPM.

FRANK B. FOSTER, INC.

2220 Oliver Building, Pittsburgh 23, Pa.
Cable "Foster, Pittsburgh" Telephone Atlantic 1-2780

NEW MILL MOTORS



IN STOCK

2—325 HP G. E. Type MDP-421AE2R, 375-1400 RPM, 230 volt, 1150 Amp., Model 29B770, 75 Deg. C Cont., 72 V SEP Exc., Shunt Wd., Encl. Forced Vent., Roller Bearing.

J E C

JOLIET EQUIPMENT CORP.

Box 1078 Joliet, Ill.

Phone: Joliet SA 7-4738
Chicago BI 2-2458

MAGNETS
FOR SALE

Two (2) only E.C.&M. 55" Bolted type Magnets. Govt. Surplus. Not used. Half price.

George K. Brown
11901 AVENUE "O"
CHICAGO, ILL.
Ph. Regent 1-0232

EST. 1904

DAVIDSON

PIPE SUPPLY CO., INC.

ONE OF THE LARGEST STOCKS IN THE EAST

Seamless and Welded ⅛" to 26" O.D.
All wall thickness Manufactured.
Specialty large sizes.
Cutting — Threading — Flanging —
Fittings — Valves.

Call GEdney 9-6300
50th St. & 2nd Ave., B'klyn 32, N.Y.

SALE OR RENT

45 & 65 Ton Diesel Electric Locomotives
25 & 40 Ton Diesel Locomotive Cranes
2—1000 K.W. Diesel Generator Sets 2300 V—AC.
6700 C.F.M. Sullivan Syn. Motor Compressor, 1250 H.P., 4160V.

B. M. WEISS COMPANY
Girard Trust Bldg. Philadelphia 2, Pa.

6' x 10 Ga. Niagara Power Shear.
No. 3 Niagara Angle Bending Roll, M.D.
6" x 6" x 1" Cleveland Double Angle Shear.
6' x ⅜" Cincinnati Power Press Brake.
No. ½, No. 1½ Buffalo Univ. Ironworkers, M.D.
600 Ton Southwark Hyd. Inclined Wheel Press.
6' x ¼" Lawn Initial Bending Roll, M.D.

FALK MACHINERY COMPANY
16 Ward St., Baker 5-5887, Rochester 5, N.Y.

RR CARS AND LOCOMOTIVES

100—70 ton cap. Covered Hopper Cars
400—50 ton cap. Coal & Ore Hopper Cars
150—50 ton cap. Steel Box Cars
28—Diesel Elec. Locomotives 25, 45, 65, 70 & 115 ton G.E. & Alcoa

STANHOPE, 60 E. 42nd St., N.Y. 17, N.Y.

COX MACHINES

Pipe Cutting and Threading
Tube Cutoff
New Machines Only

The Cox and Sons Company
Bridgeton, N. J.
Catalogue upon Request

FOR SALE

55" E.C.&M. MAGNETS
Very Attractive Prices
Excellent Condition
Write — Wire — Phone

HYMAN-MICHAELS COMPANY
108 N. State St. Chicago 2, Ill.
Phone: DEarborn 2-5422

CONTRACT MANUFACTURING

DROP FORGINGS

Special Forgings—High Quality, Fast Delivery. For prompt attention phone or send prints to John Bello.

CARCO INDUSTRIES, INC.
7341 Tulip Street, Phila. 35, Pa.
DEvonshire 2-1200

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Wood and Aluminum pattern work.

KING FOUNDRIES, INC.
Phone OX-9-4825 North Wales, Montg. Co., Pa.
22 Miles from Philadelphia, Pennsylvania

K

SINCE
1895

DROP FORGINGS

Small drop forgings up to one pound in size. Inquiries invited for very prompt action.

KEYSTONE FORGING COMPANY

Northumberland Pennsylvania GReenwood 3-3525

DROP FORGINGS

To Your Specifications
Prompt Quotations
BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

METAL STAMPINGS

Send your blueprints for our prompt quotation. Latest brochure sent upon request.
CARLSTROM PRESSED METAL CO., INC.
58 Fisher Street Westboro, Mass

THE FORMULA:

Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs

The GREIST MANUFACTURING CO.
646 Blake St., New Haven 15, Conn.

SPECIFY MEEHANITE CASTINGS : FOR MAXIMUM SERVICE

SPECIAL TYPES FOR RESISTANCE TO ABRASION · HEAT · WEAR · CORROSION
AS CAST OR MACHINED.
Weights: 1—60,000 lbs.
ROSEDALE
FOUNDRY & MACHINE CO.
1731 Preble Avenue • Pittsburgh 33, Pa.
Telephone: CEdar 1-4007

Nepsco

NEW ENGLAND PRESSED STEEL COMPANY

Contract Manufacturer since 1914

METAL STAMPINGS
SPECIALTIES—APPLIANCES
For Industrial and Domestic Users
P. O. BOX 29
NATICK MASSACHUSETTS

DROP FORGINGS

Special Forgings of Every Description.
We solicit your prints or model for quotation.
Wilcox Forging Corporation
Mechanicsburg Penna.

CONTRACT MANUFACTURING

Foundry
Machining
Structural
Work

ALTEN

A dependable source for complete service; write or call
Foundry & Machine Works, Inc.
Lancaster, Ohio

Special Washers

We carry in stock Silicon killed steel specially suited for case-hardening. Stock dies for producing washers from .0015 to ½" thick.

Thomas Smith Company
394 Grove St., Worcester, Mass.

SPECIAL MACHINERY

DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings

Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons

Weatherly Foundry & Mfg. Co., Weatherly, Pa.

EQUIPMENT AND MATERIALS WANTED

WANTED

(1) Used 1500-ton forging press complete with steam intensifier, receiver and inter-connecting piping. Advise price, delivery, location, and condition, etc.

Purchasing Dept.
Harvey Aluminum, Inc.
19200 S. Western Ave.
Torrance, California

WANTED

OPEN HEARTH HOT ROLLED CARBON STEEL ROUND PIPES 6⅝" diameter, Grade 1010 in random lengths of 23 to 30 ft. for export to Austria—Monthly supply of 10,000 to 20,000 ft. Price FAS U.S. Port. Advise price, delivery, Etc.

ROBERT M. DILLON, REP.
BOHR AND ROHRTECHNIK, G.M.B.H.
206 East 34th Street, New York 16, New York

SURPLUS STEEL

NEW *WANTED* USED
Structurals, Plate, Pipe and Tubing
Consumers Steel & Supply Co.
P. O. Box 270, RACINE, WISCONSIN

WEISS STEEL CO. INC.

600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
Buyers of Surplus Steel Inventories
39 Years of Steel Service

WANTED

BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

WANTED

10 gauge to 11¾ gauge Steel Wire in coils.

Saxony Press, Inc.
233 East Forest Ave., Detroit 1, Michigan
TEmple 3-3350

WANTED
SURPLUS STEEL
WALLACK BROTHERS
7400 S. Damen Ave. Chicago 36, Illinois
GROVEHILL 6-7474

WANTED TO PURCHASE—any quantity
CARBON—ALLOY—STAINLESS
Bars—Billets—Sheet—Plate
THE GILBERT MERRILL STEEL CORP.
91 New York Ave., Westbury, L. I., N. Y.
EDgewood 3-7000

WE WANT TO BUY
"STENTOR"
TOOL STEEL
ANY SIZE—ANY QUANTITY
M. DUDGEON CO.
P. O. Box 450 PITTSBURGH, KANSAS

EMPLOYMENT EXCHANGE

Employment Service

HIGH GRADE MEN — Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 220 South State Street, Chicago 4, Illinois.

Situation Wanted

HAMMERMAN OR FORGE SHOP FOREMAN, 21 years experience on all types of flat die forgings, high temperature alloys, etc. Resume on request. Box H-146, c/o The IRON AGE, Chestnut at 56th, Phila. 39.

Position Wanted

STRUCTURAL PLANT SUPERINTENDENT 25 years as plant manager and superintendent. Fully versed on buildings and bridges. Union contract negotiations, 20 years with a 15,000 ton plant. Box H-147, c/o The IRON AGE, Chestnut at 56th, Phila. 39.

ADVERTISERS IN THIS ISSUE

An asterisk indicates that a booklet, or other information, is offered in the advertisement.

This index is published as a convenience. No liability is assumed for errors or omissions.

A

- *Airetool Mfg. Co. 112
- Ajax-Magnethermic Corp. 12
- Allen-Bradley Co. 70
- Alten Foundry & Machine Works, Inc. 145
- *American Pulverizer Co. 103
- *American Saw & Mfg. Co. 24
- *American Tool Works Co. 10
- *Armco Steel Corp. 22-23
- Armstrong Bros. Tool Co. 110

B

- Baldt Anchor Chain & Forge Div. 145
- Belyea Co., Inc. 142
- Bertsch & Co. 119
- *Bessemer & Lake Erie Railroad Co. 77
- Bethlehem Steel Co. 1
- Birdsboro Corp. 36
- *Black & Decker Mfg. Co. 37
- Bound Brook Bearing Corp. of America 95
- Geo. K. Brown 144
- *Buffalo Forge Co. 41
- *Bullard Co. 42

C

- Carco Industries, Inc. 144
- Carpenter Steel Co. 129
- Cattie, Joseph P. & Bros. Inc. 146
- *Chambersburg Engineering Co. 106
- *Chisholm-Moore Hoist Div. 101
- *Cincinnati Lathe & Tool Co. 18
- *Conco Engineering Works, Inc. 105
- Consumers Steel & Supply Co. 145
- Copperweld Steel Co., Ohio Seamless Tube Div. 40
- Copy-Art Photographers 146
- Cox & Sons Co. 144
- Crucible Steel Casting Co. 141
- *Crucible Steel Co. of America 115

D

- Damascus Tube Co. 30
- Davidson Pipe Co., Inc. 144
- *Detecto Scales, Inc. 121
- Detroit Steel Corp. 78
- *DoAll Co. 97
- *Drever Co. 107
- Dudgeon, M. Co. 145
- *Duraloy Co. 122

E

- Eastern Machinery Co. 143
- Euclid Crane & Hoist Co. 8
- *Euclid Electric & Mfg. Co. 125

GOSS and DE LEEUW
MULTIPLE SPINDLE
CHUCKING MACHINES
Tool Rotating
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN.

HOT DIP GALVANIZING
JOSEPH P. CATTIE & BROTHERS, INC.
2520 East Hagert St.
Phone: RE 9-8911 Phila. 25, Pa.

SPECIAL SERVICES TO METALWORKING

UNSURPASSED IN QUALITY AT ANY PRICE
8"x10" GLOSSY PHOTOS
6½¢ EACH IN 1,000 LOTS. $8.99 PER 100
$7.99 PER 100 IN QUANTITIES
POST CARDS $29 PER 1,000
MOUNTED ENLARGEMENTS
20" x 30" $3.50—30" x 40" $4.85.
COMPLETE COLOR SERVICE
8" x 10" as low as 95c each
U.S. LARGEST REPRODUCTION HOUSE
JJK
Established 1934
A Division of JAMES J. KRIEGSMANN
COPY-ART PHOTOGRAPHERS
165 W. 46th ST., NEW YORK 36, N.Y.

F

- Falk Machinery Co. 144
- *Farval Div., Eaton Mfg. Co. 52
- Foster, Frank B. Inc. 144
- Foster, L. B. Co. 143

G

- General Electric Co., Large Lamp Dept. 4
- German American Chamber of Commerce 125
- Gilbert Merrill Steel Corp. 145
- Goss & DeLeeuw Machine Co. 146
- Great Lakes Founders & Machine Corp. 139
- Greist Manufacturing Co. 145

H

- Hallden Machine Co. 63
- Harvey-Aluminum 145
- Haynes Stellite Co., Div. Union Carbide Corp. 20
- *Hobart Brothers Co. 104
- Hughes Arnold Co. 143, 145
- Hyatt Bearings Div., General Motors Corp. 14
- Hyde Park Foundry & Machine Co. 24
- Hyman, Joseph & Sons 143
- Hyman-Michaels Co. 144
- *Hyster Co. 72

I

- *Inductotherm Corp. 80
- Inland Steel Co. 66
- Iron & Steel Products, Inc. 142

J

- *Jacobs Mfg. Co. 28-29
- Joliet Equipment Corp. 144

K

- *Kemp, C. M., Mfg. Co. 26
- *Kennametal Inc. 16
- Keystone Forging Company 144
- Kidde, Walter & Co., Inc. 117
- King Foundries, Inc. 144

L

- Land, Inc., L. J. 143
- *Landis Machine Co., Inc. 35
- Linde Co., Div. Union Carbide Corp. 31
- Luria Bros. & Co., Inc. 131

M

- *Malleable Castings Council 98-99
- *Manco Mfg. Co. 109
- *Matthews, Jas. H., & Co. 76
- Meaker Co. Div., Sel-Rex Corp. 27
- Mesta Machine Co. Inside Front Cover
- *Metal & Thermit Corp. 68
- Milton Equipment Co. 143
- Morse Twist Drill & Mch. Co. 74
- *Mundt, Chas. & Sons 139

N

- National Business Bourse, Inc. 145
- National Machinery Exchange 143
- New England Pressed Steel Co. 145
- *Niagara Machine & Tool Works 46
- Norden Div., United Aircraft Corp. 48

O

- *Ohio Crankshaft Co. 100
- *Ohio Knife Co. 120
- Ohio Seamless Tube, Div., Copperweld Steel Co. 40
- *Olsen, Tinius, Testing Mch. Co. 141
- *Osborn Mfg. Co., Brush Div. 21

P

- *Pangborn Corp. 32-33
- Peninsular Steel Co. 47
- *Pennsylvania Flexible Metallic Tubing Co. 19
- *Philadelphia Gear Corp. 6
- Pittsburgh Steel Co. 44-45
- *Powermatic Mch. Co. 119

R

- *Republic Steel Corp. 38-39
- *Roberts, C. A., Co. 118
- Rosedale Foundry & Machine Co. 145

S

- Saxony Press, Inc. 145
- Seaway Steel Corp. 50
- Sel-Rex Corp., Meaker Co. Div. 27
- *Shepard Niles Crane & Hoist Corp. 108
- Smith, Thomas Co. 145
- Southern Foundry Supply, Inc. 142
- *Southern Screw Co. 17
- Stanhope, R. C., Inc. 144
- Sun Shipbuilding & Dry Dock Co. 125
- *Surface Combustion Div., Midland-Ross Corp. 49
- *Sylvania Electric Products, Inc. 43

T

- Texaco Inc. 65
- Tractor & Equipment Co. 143

U

- Uddeholm Co. of America, Inc. 110
- *Ulbrich Stainless Steels 127
- Union Carbide Corp., Haynes Stellite Div. 20
- Union Carbide Corp., Linde Div. 31
- United Aircraft Corp., Norden Div. 48
- U. S. Steel Wire Spring Co. 141
- Universal Machinery & Equipment Co. 143

V

- *Vascoloy-Ramet Corp. 25
- *Verson Allsteel Press Co. Back Cover

W

- Wagner Electric Corp. 34
- Wallack Bros. 145
- Ward Steel Co. 121
- Weatherly Foundry & Mfg. Co. 145
- Weiss, B. M. Co. 144
- Weiss Steel Co., Inc. 145
- Wheelock, Lovejoy & Co., Inc. 102
- Wilcox Forging Corp. 145
- Wilson, Lee, Engineering Co., Inc. Inside Back Cover

CLASSIFIED SECTION

- Clearing House 142-144
- Contract Manufacturing Appears in first and third issue of each month. See 144-145
- Equipment & Materials Wanted 145
- Employment Exchange 145

How Empire-Reeves gets better quality steels...faster

Lee Wilson open coil annealing improves uniformity, facilitates delivery, reduces inventory at Empire-Reeves

"Improved customer service," reports Donald W. Frease, President of Empire-Reeves Steel Corporation," is just one of the assets the addition of the Lee Wilson Open Coil Annealing has given Empire."

"We can now process orders with much greater speed," he continues, "yet we can reduce our inventory in the annealing department, because—by opening the coil—hot gases can saturate the entire coil in a fraction of the time previously required. Cool-down is just as efficient.

"The quality of our product is improved because the heat quickly reaches every square inch of the surface of the steel coil. This means it receives a perfectly uniform anneal with an absolute minimum of hardness variation. Because we are handling individual coils instead of continuous strip we have wonderful flexibility. We can process short orders as easily as long runs.

"The Lee Wilson Open Coil Process thus enables us to improve our customer service and our product, and at the same time, gives us the most efficient annealing system available today," Mr. Frease concludes.

If a better product or more efficient annealing department appeals to you, why not get the last word on annealing practice. The Lee Wilson sales engineer in your area will be happy to meet with you at your convenience.

Donald W. Frease, President of Empire-Reeves Steel Corporation (center), tells J. L. Whitten, Vice President of Sales of Lee Wilson (right), and E. G. Fenton of Empire, the results of Open Coil Annealing at Empire after the first few months of operation.

Lee Wilson
OPEN COIL PROCESS

Overall view of the Lee Wilson Open Coil Annealing installation at Empire-Reeves' Mansfield, Ohio, plant.

Lee Wilson® ENGINEERING COMPANY, INC.

20005 LAKE ROAD • CLEVELAND 16, OHIO

HIGH PRODUCTION ANNEALING SYSTEMS

MAKE THE BEST METALS BETTER

® ORIGINATORS AND LEADING PRODUCERS OF OPEN COIL AND SINGLE STACK FURNACES

4081

"QUICK ON THE DRAW"
Verson

VERSON HYDRAULIC PRESS
lowers cost for John Wood Company

The Hot Water Heater and Tank Division of the John Wood Company, Chicago, Illinois, employs a Verson Hydraulic Press with Hydrol Speed Circuit to produce hot water tank heads from 12″ to 24″ diameters.

The 350 ton press operates at a fast advance speed of 1125 inches per minute, slows to a pressing speed of 81 inches per minute and has a fast return of 458 inches per minute. Using pre-blanked stock from 11 gauge to ¼″ steel, the press draws the metal to desired shape quicker, and more efficiently than was possible with two presses previously used. The plant's usable floor space is increased and at the same time labor cost of this operation has been cut in half.

Whatever your requirements, you'll find that Verson can provide the press you need to make your operations more efficient. As a big plus, you get all the advantages of Verson know-how and experience in the press working of metals. It can make a big difference in your profits. It's easy to put the Verson team to work for you. Just contact your Verson Representative. For data on the entire Verson line, write for Catalog G-60.

Verson

Originators and pioneers of allsteel stamping press construction

VERSON ALLSTEEL PRESS CO.

9314 S. Kenwood Avenue, Chicago 19, Illinois • 8300 S. Central Expressway, Dallas, Texas

247C

MANUFACTURERS OF MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • IMPACT MACHINING PRESSES
TOOLING • DIE CUSHIONS • VERSON-WHEELON HYDRAULIC PRESSES • HYDRAULIC SHEARS • PLASTICS MOLDING PRESSES